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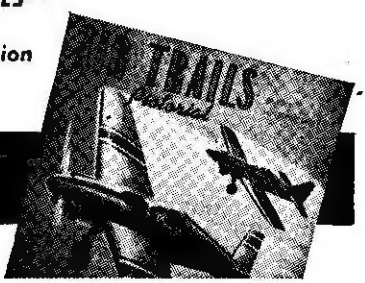

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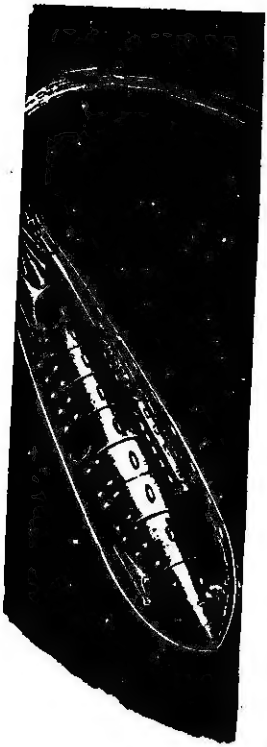

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ELDER BROTHER MARS

Since Lowell's earnest study of the planet, and his many writings and speculations concerning it, Mars has been pictured as a dying planet, dying of old age, losing air and water into the vacuum of space, while an ever more severely strained people try to maintain life.

As of the time he wrote, those speculations were based as soundly as possible. As of today, they are not—and some really more interesting aspects appear.

First, thermodynamic calculations, based on specific heats and masses, thermal conductivity and radiation, show that any of the planets, from tiny moons to massive Jupiter would have, perforce, cooled so rapidly as to be solid within a mere instant of geological time. In the first place, they would cool violently by evaporation—literally. High temperature molecules can escape from a gravitational field where cooler—and hence slower—molecules are retained. That effect is a perfect Maxwell's Demon set-up; the Demon of gravitation selectively puts the hot molecules in one lot—the escapees—and the cool molecules in another lot—the planet-to-be. Second, radiation from a red-hot planet is extremely rapid; the Sun has to annihilate three million tons of matter per second to maintain its surface temperature. The smaller the planet, the faster it will cool, of course—but even the largest would cool in a few hundred thousand years—down to a point.

In any case, the differences in cooling time were unimportant in a geological time-scale sense. Mars is no older than Earth; it was just smaller to start with. Its rate of water air loss at the present time is infinitesimal; it lost water and gases during the period of original rapid cooling by evaporation. In all the ages of organic evolution on Earth—a period of over one billion five hundred million years—the conditions on the surface of Mars would have changed so slightly as to be of no importance to life processes. Mars isn't a wizened "elder brother" of Earth; Mars was simply the runt of the litter, robbed of its birthright from the beginning by the bloated giant, Jupiter.

There would, then, be no reason to expect evolution to have "had time to progress further on the older planet"—it isn't older. Evolution wouldn't have progressed as

far, probably, because of the less favorable conditions.

But there's a more interesting, a wider-spread time-scale to consider. Based on our present day—admittedly not final and absolute!—knowledge of nuclear physics, the only elements that stars can manufacture are helium, carbon, nitrogen and oxygen, using hydrogen as the building material. No heavier element can be made in a star, even those elements up to silver which yield energy when they are formed. To produce elements such as uranium, which can be formed only under conditions of such unimaginable, appalling violence that the atomic bomb would, instead of exploding, be forced to *implode,* something utterly different must be postulated.

A nucleus such as uranium—or thorium, bismuth, even lead—represents a system of nuclear particles jammed together under such appalling violence that it *lessened* the external pressures and energy-intensities to force those nuclei together. Somewhere, somewhen, the intensity and density of energy-matter must have been so inconceivably great that the violence of the atomic fission bomb would have represented a cooling, expanding decrease of violence! In that environment, uranium, instead of fissioning to barium and xenon, was squeezed into being by pressures and cataclysm sufficient to force barium and xenon into one!

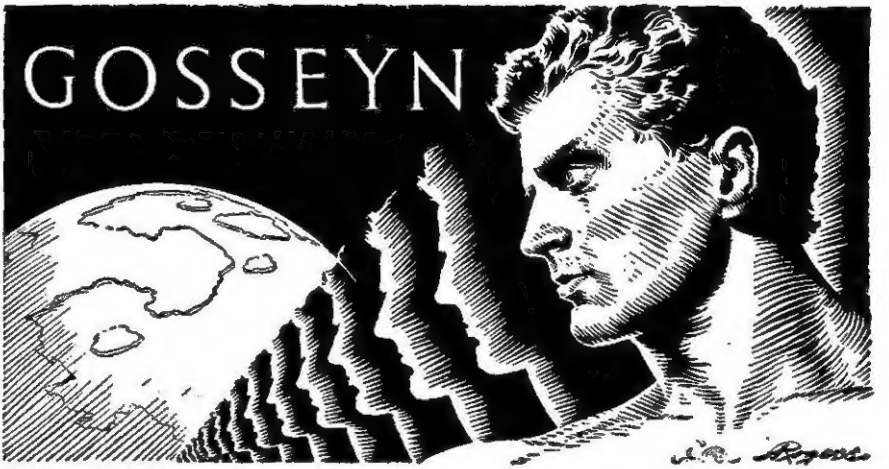
From that ancient center of inconceivable violence came uranium, iron, all the heavy elements that no star can produce. All the unstable elements, like uranium, thorium, and the others must have existed only, and temporarily, since that time.

Because they are temporary and radioactive, we can form an estimate of how long ago that time was. A dozen lines of evidence suggest something about four billion years ago—which checks moderately well among different indications as the time at which the universe exploded into being.

There could have been no suns, no planets, no life before that time. Our Sun and our Earth, then, are about as old as any existing in all the universe. Man is not a latecomer in the universe; his world started even with a billion others.

The remaining questions, however, are two: does evolution always proceed at the same, or approximately the same pace? And—the most recent evidence suggests Man, modern Homo sapiens, has been on Earth for approximately four hundred thousand years. Did other intelligent races dawdle in changeless barbarism for three hundred ninety thousand years after they appeared? After all, two hundred thousand years of civilization would be time for quite a bit of advancement—though even two hundred thousand years is an inappreciable percentage of error in the total time-scale we're considering!

THE EDITOR.



THE PLAYERS OF Ā

BY A. E. VAN VOGT

[Part 1 of 4 parts]

***Gilbert Gosseyn** had, for a moment, turned the force of the Greatest Empire—but problems of the vast might of the Galaxy—and of the hidden Chess Player—had to be solved!*

Illustrated by Rogers

I.

Abstracts

A normal human nervous system is potentially superior to that of any animal's. For the sake of sanity and balanced development, each individual must learn to orientate himself to the real world around him. There are methods of training by which this can be done.

Shadows. A movement on the hill where the Games Machine had once stood, where all was now desolation. Two figures, one curiously shapeless, walked slowly among the trees. As they came out of the darkness, and into the light of a street lamp that stood like a lonely sentinel on this height from which they could overlook the city—one of the figures resolved into a normal two-legged man.

The other was a shadow, made of shadow stuff, made of blackness through which the street lamp was visible.

A man, and a shadow that moved like a man, but was not. A shadow man, who stopped as he reached the protective fence that ran along the lip of the hill. Who stopped and motioned with a shadow arm at the city below, and spoke suddenly in a voice that was not shadowy but very human.

"Repeat your instructions, Janasen."

If the other man was awed by his strange companion, he did not show it. He yawned slightly.

"Kind of sleepy," he said.

"Your instructions!"

The man gestured in irritation. "Look, Mister Follower," he said in an annoyed voice, "don't talk like that to me. That get-up of yours doesn't scare me in the slightest. You know me. I'll do the job."

"Your insolence," said the Follower, "will try my patience once too often. You know that there are time energies involved in my own movements. Your delays are calculated to offend, and I will say this: If I am ever forced into an unpleasant position because of that tendency on your part, I'll end our relationship."

There was such a savage note in the Follower's voice that the man said no more. He found himself wondering why he taunted this immeasurably dangerous individual, and the only answer he could think of was that it burdened his spirit oppressively to realize that he was the paid agent of a being who was his master in every respect.

"Now, quick," said the Follower, "repeat your instructions."

Reluctantly, the man began. The words were meaningless to the breeze that blew from behind them; they drifted on the night air like phantasms out of a dream, or shadows that dissipated in sunlight. There was something about taking advantage of the street fighting that would now shortly end. There would be a position open in the Institute of Emigration. "The false papers I have will give me the job during the necessary time." And the purpose of the scheming was to prevent a Gilbert Gosseyn from going to Venus until it was too late. The man had no idea who Gosseyn was, what it was Gosseyn was to be late for—but the means were clear enough. "I'll use every authority of the Institute, and on Thursday, fourteen days from now, when the *President Hardie* leaves for Venus, I'll arrange for an accident to take place at a certain time—and you'll see to it that he's there for it to happen to him."

"I don't see to anything of the kind," said the Follower in a remote voice. "I merely foresee that he will be there at the proper instant. Now, what is the moment of the accident?"

"9:28 a.m., zone 10 time."

There was a pause. The Follower seemed to be in meditation. "I must warn you," he said at last, "that Gosseyn is an unusual individual. Whether this will affect events or not, I do not know. There

seems no reason why it should, but still there is the possibility. Take heed."

The man shrugged. "I can only do my best. I'm not worried."

"You will be removed in due course in the usual fashion. You can wait here or on Venus."

"Venus," said the man.

"Very well."

There was silence. The Follower moved slightly, as if to free himself from the restraint of the other's presence. The shadow shape of him seemed suddenly less substantial. The street lamp shone sharply through the black substance that was his body, but even as the misty thing grew duller, vaguer, less clearly marked, it held together, held its form. It vanished as a whole, and was gone as if it had never been.

Janasen waited. He was a practical man, and he was curious. He had seen illusions before, and he was partially convinced that this was one. After three minutes, the ground glowed. Janasen retreated warily.

The fire raged furiously, but not so violently that he did not see the inner works of a machine with intricate parts as the white, hissing flames melted the structure into a shapeless mass. He did not wait for the end, but started to walk along the pathway that led down to a robocar station.

Ten minutes later he was deep in the city.

The transformation of time energy proceeded at its indeterminable pace to the hour of 8:43 a.m. on the first Thursday of March, 2561 A.D. The accident to Gilbert Gosseyn was scheduled for 9:28.

8:43 a.m. At the spaceport on the mountain above the city, the Venus-bound *President Hardie* floated into take-off position. It was due to leave at one o'clock in the afternoon.

Two weeks had passed since the Follower and his henchman looked down at the city from a world bathed in night. It was two weeks and a day since a bolt of electricity had spouted from an energy cup in the Institute of General Semantics, and bloodily sheared off the head of Thorson.* As a result within three days the fighting in the city proper had ended.

Everywhere robotools whirred, buzzed, hissed and worked under the direction of their electronic brains. In eleven days a gigantic city came back to life, not without sweat, not without men having to bend their backs beside the machines. But the results were already colossal. Food supply was back to normal. Most of the scars of battle were gone. And, of overwhelming importance, the fear of the unknown forces that had struck at the solar system from the stars was fading more with each bit of news from Venus, and with each passing day.

8:30 a.m. On Venus, in the pit—

* "The World of A, August, September, October, 1945, Astounding Science Fiction; Simon and Schuster, 1948.

that had once been the secret galactic base of the Greatest Empire in the solar system—Patricia Hardie sat in her tree apartment studying an abridged stellar guidebook. She was dressed in a three-day casual—which she would wear today only before destroying it. She was a slender young woman whose good looks were overshadowed by another more curious quality—an air of authority. The man who opened the door and came in at that moment paused to gaze at her, but if she had heard his entrance she gave no sign.

Eldred Crang waited, faintly amused, but not offended. He respected and admired Patricia Hardie, but she was not yet fully trained in the Ā philosophy, and therefore she still had set techniques of reaction, of which she was probably unaware. As he watched she must have gone through the unconscious process of accepting the intrusion, for she turned and looked at him.

"Well?" she asked.

The lean man walked forward. "No go," he said.

"How many messages is that?"

"Seventeen." He shook his head. "I'm afraid we've been slow. We took it for granted Gosseyn would find his way back here. Now our only hope is that he'll be on the ship that leaves Earth today for Venus."

There was silence for a while. The woman made some marks with a needle-sharp instrument in the guidebook. Each time she touched the page, the material glowed with a faint bluish light. She shrugged finally.

"It can't be helped. Who'd have thought Enro would discover so quickly what you were doing? Fortunately, you were prompt, and so his soldiers in this area are scattered to dozens of bases, and are already being used for other purposes."

She smiled admiringly. "You were very clever, my dear, releasing those soldiers to the tender mercies of base commanders. They're all so eager to have more men in their sectors that when some responsible officer gives them a few million they actually try to hide them. Years ago, Enro had to evolve an elaborate system for locating armies lost in just that fashion."

She broke off. "Did you find out how much longer we can stay here?"

"Bad news on that point," said Crang. "They have orders on Gela 30 to cut Venus off the individual 'matrix' circuit the moment you and I get to Gela. They're leaving the way open for ships to come this way, which is something; but I was told that the individual 'Distorters' will be cut off in twenty-four hours whether we get to Gela or not."

He stood frowning. "If only Gosseyn would hurry. I think I could hold them an extra day or so without revealing your identity. I think we should take the risk involved. As I see it, Gosseyn's more important than we are."

"There's a tone in your voice," Patricia Hardie said sharply.

"Something has happened. Is it war?"

Crang hesitated, then: "When I was sending the message just now, I tuned in on a confusion of calls from somewhere near the center of the galaxy. Some nine hundred thousand warships are attacking the central League powers in the Sixth Decant."

The young woman was silent for a long time. When she finally spoke, there were tears in her eyes. "So Enro has taken the plunge." She shook her head angrily and wiped her tears. "That settles it. I'm through with him. You can do anything you please to him if you ever get the chance."

Crang felt unmoved. "It was inevitable. The quickness of it annoys me. We've been caught off base. Just imagine, waiting till yesterday to send Dr. Kair to Earth to look for Gosseyn."

"When will he get there?" She waved her hand. "Never mind. You've told me that before, haven't you? Day after tomorrow. Eldred, we can't wait."

She stood up, and came over to him. Her eyes were narrowed with speculation as she studied his face. "You're not going to make us take any desperate chances, I hope."

"If we don't wait," said Crang, "Gosseyn'll be cut off here nine hundred seventy-one light-years from the nearest interstellar transport."

Patricia said quickly: "At any moment Enro might have an atomic bomb 'similarized' into the pit."

"I don't think he'll destroy the base. It took too long to build up, and besides, I have an idea he knows you're here."

She looked at him sharply, "Where would he obtain such information?"

Crang smiled. "From me," he said. "After all, I had to tell Thorson who you were to save your life. I also told an intelligence agent of Enro."

"Still," said Patricia, "all this is based on wishful thinking. If we get out safely, we can come back for Gosseyn."

Crang stared at her thoughtfully. "There's more to this than meets the eye. You forget that Gosseyn always assumed that beyond him, or behind him, was a being he called, for want of a better name, a cosmic chess player. That's, of course, a wild comparison, but if it had *any* application whatsoever, then we've got to assume a second player. Chess is not a game of solitaire. Another thing: Gosseyn regarded himself as approximately a seventh-row pawn. Well, I think he became a 'queen' when he killed Thorson. I tell you, Reesha, it's dangerous to leave a queen in a position where it can't move. He should be out in the open, out among the stars, where he'll have the greatest possible mobility. In my opinion, so long as the players are hidden and able to make their moves without being caught or observed, just so long is

Gosseyn in deadly danger. I think a delay of even a few months might be fatal."

Patricia was briefly silent, then: "Just where are we going?"

"Well, we'll have to use the regular transmitters. But I plan on us stopping somewhere to get news. If it's what I think it will be, there's only one place for us to go."

"Oh!" the woman said in a flat tone. "Just how long do you intend to wait?"

Crang gazed at her somberly, and drew a deep breath. "If Gosseyn's name," he said, "is on the passenger list of the *President Hardie*—and I'll get that list a few minutes after it takes off from Earth—we'll wait here till it arrives—three days and two nights from now."

"And if his name is not on the list?"

"Then we leave here as soon as we've made sure of that."

The name of Gilbert Gosseyn, as it turned out, was not on the passenger list of the *President Hardie*.

8:43 a.m. Gosseyn wakened with a start, and almost simultaneously became aware of three things. What the time was. That the sun was shining through the hotel room window. And that the videophone beside the bed was buzzing softly but insistently.

As he sat up, he came further out of sleep, and abruptly remembered that this was the day the *President Hardie* was scheduled to leave for Venus. The thought galvanized him. The fighting had reduced travel between the two planets to a once-a-week basis, and he still had the problem of obtaining permission to get aboard today. He bent down and clicked on the receiver but, because he was still in his pajamas, left the video plate blank.

"Gosseyn speaking," he said.

"Mr. Gosseyn," said a man's voice, "this is the Institute of Emigration."

Gosseyn stiffened. He'd known this was going to be the day of decision, and there was a tone to the voice on the phone that he didn't like.

"Who's talking?" he asked sharply.

"Janasen."

"Oh!" Gosseyn scowled. This was the man who had put so many obstacles in his way, who had insisted upon his producing a birth certificate and other documents and had refused to recognize a favorable lie detector test. Janasen was a minor official, a rank which was surprising in view of his almost pathological refusal to do anything on his own initiative. He was no person to talk to on the day that a ship was due to leave for Venus.

Gosseyn reached down and clicked on the video plate. He waited till the image of the other's sharp face was clear, then: "Look, Janasen, I want to talk to Yorke."

"I have received my instructions from Mr. Yorke." Janasen was imperturbable. His face looked

strangely sleek in spite of its thinness.

"Put me through to Yorke," said Gosseyn.

Janasen ignored the interruption. "It has been decided," he said, "that in view of the troubled situation on Venus . . ."

"Get off the line!" Gosseyn said in a dangerous voice. "I'll talk to Yorke, and to no one else."

". . . that in view of the unsettled situation on Venus, your application for entrance is refused," said Janasen.

Gosseyn was furious. For fourteen days he had been held off by this individual, and now, on the morning of the departure of the ship, here was the decision.

"This refusal," said the unfazable Janasen, "will in no way debar you from making your application again when the situation on Venus has been clarified by directives from the Venusian Council for Immigration."

Gosseyn said: "Tell Yorke I'll be along to see him right after breakfast."

His fingers flipped the switch, and broke the connection.

Gosseyn dressed swiftly, and then paused for a final survey of himself in the full length mirror of the hotel room. He saw a tall, stern-faced young man of thirty-five or so. His vision was too sharp for him not to notice the unusual qualities of that image. At a casual glance, he looked quite normal, but to his own eyes his head was clearly too large for his body. Only the massiveness of his shoulder, arm and chest muscles made his head even tolerable in proportion. As it was he could think of it falling within the category of "leonine". He put on his hat, and now he looked like a big man with a strongly muscled face, which was satisfactory. As much as possible he wished to remain inconspicuous. The extra-brain, which made his head nearly a sixth larger than that of an ordinary human being, had its limitations. In the two weeks that had passed since the death of the mighty Thorson, he'd been free for the first time to test its terrific powers—and the results had sharply modified his earlier feeling of invincibility.

A few minutes over twenty-six hours was the maximum time during which his "memorized" version of a section of floor was valid. No change might be visible in the floor, but somehow it altered, and he could no longer retreat to it in the instantaneous "similarity" fashion.

That meant he must, literally, rebuild his defenses every morning and evening in overlapping series, so that he'd never be caught without a few key points to which he could escape in an emergency. There were several puzzling aspects to the time limits involved. But that was something to investigate when he got to Venus.

As he stepped into the elevator a moment later, he glanced at his

watch. 9:27.

One minute later, at 9:28, the time for which the accident was scheduled, the elevator crashed to destruction at the bottom of its shaft.

II.

Abstracts

General semantics enables the individual to make the following adjustments to life: (1) He can logically anticipate the future. (2) He can achieve according to his capabilities. (3) His behavior is suited to his environment.

Gosseyn arrived at the mountain take-off point a few minutes before eleven o'clock. The air at this height was briskly cool, and the effect was of exhilaration. He stood for a while near the high fence beyond which the spaceship lay on its cradle. *The first step,* he thought, *was to get through the fence.*

That was basically easy. The area swarmed with people, and one more, once he got inside, would scarcely be noticed. The problem was to get in without anyone observing him materialize.

He felt no regrets, now that he had made up his mind. The slight delay caused by the accident—he'd escaped from the elevator by the simple process of "similarizing" himself back into his hotel room—had brought a keen awareness of how little time remained to him. He had a picture of himself trying to obtain a certificate of admission from the Institute of Emigration at this final day. The visualization was all he needed. The time for legality was past.

He selected a spot on the other side of the fence behind some packing cases, "memorized" it, stepped behind a truck—and a moment later walked out from behind the packing cases and headed towards the ship. Nobody tried to stop him. Nobody gave him more than a passing glance. The fact that he was inside the fence was credential enough apparently.

He walked aboard and spent his first ten minutes "memorizing" a dozen floor areas with his extra brain—and that was that. During the take-off, he lay comfortably on the bed of one of the finest suites on the ship. About an hour later, a key rattled in the lock. Swiftly, Gosseyn attuned to a "memorized" area, and swiftly he was transported to it.

He'd chosen his materialization positions skillfully. The three men who saw him step out from behind a heavy girder obviously took it for granted that he had been there for several minutes, for they scarcely glanced at him. He walked easily to the rear of the ship, and stood before the great plexiglass port gazing down at Earth.

The planet was vast below him. It was an immense world that still showed color. As he watched, it

slowly turned a grayish dark, and looked rounder every minute. It began to contract sharply, and for the first time he saw it as a great misty ball floating in black space.

It looked somehow unreal.

He stayed that first night in one of the many unoccupied cabins. Sleep came slowly, for his thoughts were restless. Two weeks had passed since the death of the mighty Thorson, and he hadn't heard a word from Eldred Crang or Patricia Hardie. All his attempts to contact them through the Institute of Emigration had met with the unvarying reply, "Our Venusian office reports your message undeliverable." He'd thought once or twice that Janasen, the Institute official, took a personal satisfaction in giving him the bad news, but that seemed hardly possible.

There was no question, so it seemed to Gosseyn, that Crang had seized control of the galactic army on the very day Thorson died. The papers'd been full of the news of the withdrawal of the invaders from the cities of non-Aristotelian Venus. There was confusion as to the reason for the mass retreat, and the editors did not seem to be clear as to what was happening. Only to him who knew what had preceded the enormous defeat was the situation understandable. Crang was in control. Crang was shipping the galactic soldiers out of the solar system as fast as his two-mile-long, "similarity" powered ships could carry them—before Enro the Red, military overlord of the Greatest Empire discovered that his invasion was being sabotaged.

But that didn't explain why Crang had not delegated someone to get in touch with Gilbert Gosseyn who, by killing Thorson, had made all this possible.

Gosseyn slept uneasily on that thought. For though the desperate danger of the invasion was temporarily averted, his own personal problem was unsolved—Gilbert Gosseyn, who possessed a trained extra brain, who had died, yet lived again in a highly similar body. His own purpose must be to find out about himself and his strange and tremendous method of immortality. Whatever the game that was being played around him, he seemed to be one of the important and powerful figures in it. He must have been tensed by the long strain he'd been under and by the hideous fight with Thorson's armored guard, or he would have realized sooner that, like it or not, for better or for worse, he was above the law. He should never have wasted his time with the Institute of Emigration.

Nobody questioned him. When officers came towards him, he stepped out of sight, and vanished to one of his "memorized" areas. Three days and two nights after the start, the ship eased down through the misty skies of Venus. He had glimpses of colossal trees, and then a city grew onto the horizon. Gosseyn came down the gangplank with

the rest of the four hundred passengers. From his place in the fast moving line he watched the process of landing. Each person stepped up to a lie detector, spoke into it, was confirmed, and passed through a turnstile into the main part of Immigration Hall.

The picture clear in his mind, Gosseyn "memorized" a spot behind a pillar beyond the turnstile. Then, as if he had forgotten something, he returned aboard the ship and hid until dark. When the shadows lay deep and long in the land below, he materialized behind the pillar of the immigration building, and walked calmly toward the nearest door. A moment later he stepped down onto a paved sidewalk, and looked along a street that shone with a million lights.

He had an acute sense of being at the beginning and not the end of his adventure—Gilbert Gosseyn, who knew just enough about himself to be dissatisfied.

The pit was guarded by a division of Venusian As, but there was no interference with the thin but steady stream of visitors. Gosseyn wandered disconsolately along the brightly lighted corridors of the underground city. The vastness of what had once been the secret base in the solar system of the Greatest Empire overshadowed his body. Silent "distorter-type" elevators carried him to the higher levels, through rooms that glittered with machines, some of which were still operating. At intervals he paused to watch Venusian engineers singly and in groups examining instruments and mechanical devices. A communicator snatched Gosseyn's attention, and a sudden wonder made him stop and switch it on. There was a pause, then the voice of the roboperator said in a matter-of-fact tone:

"What star are you calling?"

Gosseyn drew a deep breath. "I'd like," he said, "to speak to either Eldred Crang or Patricia Hardie."

He waited, with rising excitement. The idea had come like a flash, and he could hardly imagine its being successful. But even if no contact was established, that in itself would be information of a sort. After several seconds, the robot said:

"Eldred Crang left the following message: 'To anyone who may attempt to locate me, I regret that no communication is possible'." That was all. There was no explanation. "Any other call, sir?"

Gosseyn hesitated. He was disappointed, but still the situation was not entirely adverse. Crang had left the solar system connected with the vast interstellar videophone organization. It was a tremendous opportunity for the Venusians, and it gave Gosseyn a personal thrill to imagine what they could do with it. Another question formed in his mind. The answer of the roboperator was prompt:

"It would take a ship about four hours to come here from Gela 30, which is the nearest base."

It was a point Gosseyn was very much interested in. "I thought 'Distorter' transport was virtually instantaneous."

"There is a margin of error in the transport of matter, although the traveler had no physical awareness of it. To him it appears to be an instantaneous process."

Gosseyn nodded. He could understand that to some extent. Twenty decimal similarity was not perfect. He continued, "Suppose I made a call to Gela. Would it take eight hours to get a message back?"

"Oh, no. The margin of error on the electronic level is infinitesimally small. The error to Gela would be about one-fifth of a second. Only matter is slow."

"I see," said Gosseyn. "You can talk right across the galaxy with scarcely any delay."

"That is right."

"But suppose I wanted to talk to someone who didn't speak my language?"

"There is no problem. A robot translates sentence by sentence in as colloquial a manner as possible."

Gosseyn wasn't sure about there being no problem in such a verbal transference. Part of the Ā approach to reality had to do with the importance of word-word relationships. Words were subtle, and frequently had little connection with the facts they were supposed to represent. He could imagine innumerable mix-ups between galactic citizens who did not speak each other's languages. Since the galactic empires did not teach Ā, or practice it, they were apparently unaware of the dangers of misunderstanding implicit in the process of inter-

communication through robots.

The important thing was to be aware of the problem from moment to moment. Gosseyn said: "That's all, thank you!" and broke the connection.

He arrived presently in the tree apartment which he had shared with Patricia Hardie while they were both prisoners of Thorson. He looked for a message that might have been left for him, a more complete and personal account than could be intrusted to the videophone exchange. He found several transcribed conversations between Patricia and Crang—and had what he wanted.

The references to Patricia's identity did not surprise him. He had always hesitated to accept her statements about her personal life, even though she had proved trustworthy in the fight against Thorson. The information that the great war in space had started shocked him. He shook his head to the suggestion that they would return for him in a "few months". Too long by far. But the gathering awareness that he was cut off in an isolated sun system made him sharply attentive to the rather complete account of the effort Crang had made to get in touch with him on Earth.

Janasen was responsible, of course. Gosseyn sighed with understanding. But what was the matter with the man, that he had taken it upon himself to frustrate one individual whom he did not know? Personal dislike? Could be. Stranger things had happened. But, on reflection, it seemed to Gosseyn that that was not the explanation.

More thoughtfully, he played over what Crang had said about possible hidden players and his danger from them. It was oddly convincing, and it directed his thought back to Janasen like a beacon.

The man was his starting point. Somebody had moved Janasen onto the "board", perhaps only for a fleeting moment of universe time, perhaps only for a fleeting purpose, a mere pawn in this great game—but pawns, also, were looked after. Pawns came from somewhere and, when they were human, returned whence they came. There was probably no time to waste.

Yet, even as he accepted the logic of that, another purpose grew in Gosseyn's mind. He considered a few of the possibilities, then sat down at the apartment communicator, and made his call. When the roboperator asked him what star he wanted, he said:

"Give me the highest official available at the head offices of the Galactic League."

"Who shall I say is calling?"

Gosseyn gave his name, and then settled down to wait. His plan was simple. Neither Crang nor Patricia Hardie would have been able to advise the League as to what had happened in the solar system. It was a chance that neither could have taken without grave risks. But the League, or at least a tiny

division of it, had exerted its weak influence in an attempt to save Venus from Enro, and Patricia Hardie had stated that its permanent officials were interested in Ā from an educational viewpoint. Gosseyn could see many advantages in making the contact. The roboperator's voice interrupted his thought:

"Madrisol, the secretary of the League will speak to you."

The words were scarcely uttered when a lean, intense face image grew onto the videoplate. The man seemed about forty-five years old, and many passions were written on his face. His blue eyes had a burning quality. His gaze darted over Gosseyn's face. At last, apparently satisfied, Madrisol's lips moved in speech. There was a short delay, and then:

"Gilbert Gosseyn?"

The robot translator's tone had a query in it. If it was a reasonably exact representation of the original, then it was a remarkable job. Who, the tone suggested, was Gilbert Gosseyn?

That was one point that Gosseyn didn't discuss in any kind of detail. He kept his account to events in the solar system "in which I have reason to believe the League has interested itself". Yet even as he was speaking he had a sense of disappointment. He had expected a measure of Ā appearance in the permanent secretary general of the League, but this man's face showed him to be a thalamic individual. Emotions would rule him. Most of his actions and decisions would be reactions based upon emotional "sets", and not upon Ā cortical-thalamic processes.

He was describing the possibilities of using Venusians in the battle against Enro, when Madrisol interrupted both his train of thought and his narrative.

"You're suggesting," he said pointedly, "that the League States establish transport communication with the solar system, and permit trained null-As to direct the League side of the war."

Gosseyn bit his lip. He took it for granted that Venusians would achieve the highest positions in a short time, but thalamic individuals mustn't be allowed to suspect that. Once the process started, they'd be surprised at the swiftness with which men of Ā, who had come originally from Earth, would attain the highest positions which they felt it necessary to achieve. Now, he mustered a bleak, humorless smile, and said:

"Naturally, null-A men would be of assistance in a technical capacity."

Madrisol frowned. "It would be difficult," he said. "The solar system is hemmed in by star systems dominated by the Greatest Empire. If we attempted to break through, it might seem as if we attached some special importance to Venus, in which case Enro might destroy your planets. However, I will take the matter up with the proper officials, and you may be sure that what can

be done will be. But now, if you please—"

It was dismissal. Gosseyn said quickly:

"Your excellency, surely some subtle arrangement can be made. Small ships could slip through, and take a few thousand of the most highly trained men out where they could be of assistance."

"Possibly, possibly" — Madrisol looked impatient, and the mechanical translator made his voice sound the same way,—"but I'll take that up with—"

"Here on Venus," Gosseyn urged, "we have an intact 'distorter' ship transmitter capable of handling spaceships ten thousand feet long. Perhaps your people could make use of that. Perhaps you could give me some idea as to how long uch a transmitter remains 'similarized' with transmitters on other stars."

"I shall refer all these matters," said Madrisol, "to the proper experts, and decisions will be made. I presume there will be someone available and authorized to discuss the problem at your end."

"I'll have the roboperator see to it that you talk to the, uh, properly constituted authorities here," said Gosseyn, and suppressed a smile. There were no "authorities" on Venus, but this was no time to go into the vast subject of Ā voluntary democracy.

"Good-by and good luck."

There was a click, and the intense face vanished from the plate. Gosseyn instructed the roboperator to switch all future calls from space to the Institute of Semantics in the nearest city, and broke the connection. He was reasonably satisfied. He had set another process in motion and, though he had no intention of waiting, at least he was doing what he could.

Next, Janasen—even if it meant going back to Earth.

III.

Ābstracts

In order to be sane and adjusted, an individual must realize that he cannot know all there is to know. It is not enough to understand this limitation intellectually. The understanding must be an orderly and conditioned process "unconscious" as well as "conscious". Such a conditioning is essential to the balanced pursuit of knowledge.

The hour seemed late; and Janasen was not yet recovered from the surprise of having been snatched from the offices of the Institute of Emigration. He had not suspected the presence of a transport machine in his own office. The Follower must have other agents in this planetary system. He looked around him cautiously. He was in a dimly lighted park area. A waterfall cascaded from some invisible height beyond a clump of trees. The plume of spray glittered in the vague light.

The Follower stood partly silhouetted against the spray, but his formless body seemed to merge with the greater darkness on every side. The silence grew long, and Janasen fidgeted, but he knew better than to speak first. At last the Follower stirred, and drifted several feet nearer.

"I had difficulty adjusting myself," he said. "These intricate energy problems have always annoyed me, since I am not mechanically minded."

Janasen held his silence. He had not expected an explanation, and he did not feel qualified to interpret the one he had received. He waited.

"We must take a chance," said the Follower. "I have followed my present course because I wish to isolate Gosseyn from those who could help him, and I wish to force him into a position where I can study him and, if necessary, destroy him. The plan that I have agreed to pursue in support of Enro the Red cannot be interfered with by a person of unknown potentialities."

In the darkness, Janasen shrugged. For a moment, then, he wondered at his own indifference. For a moment there was a bright thought in his mind that there was something supernormal about a man like himself. The thought passed. It didn't matter what chance he took, or what were the unknown potentialities of his opponents. He didn't care. "I'm a tool," he told himself with pride. "I serve a shadow master."

He laughed wildly. For he was intoxicated with his own ego, and the things that he did and felt and thought. Janasen he had called himself because it was as close as he could get to his real name. David Janasen.

The Follower spoke again: "There are curious blurs," he said, "in the future of this man Gosseyn, but pictures do come through . . . though no Predictor can get them clearly. Yet I am sure that he will seek you out. Do not try to prevent him. He will find that your name was on the list of passengers of the *President Hardie*. He will wonder that he did not see you, but at least it will indicate to him that you are now on Venus. At this moment we are in a park in downtown New Chicago—"

"Huh!" Janasen glanced around in astonishment. But there were only the trees, and shadowy-like shrubs, and the hiss of the waterfall. Here and there in the darkness weak lights cast their pale glow, but there was no sign of a city.

"These Venusian cities," said the Follower, "have no parallel elsewhere in the galaxy. They are differently arranged, differently planned. Everything is free, food, transport, shelter—*everything*."

"Well, that makes things simple."

"Not quite. The Venusians have become aware of the existence of human beings on the planets of

other stars. Having been invaded once they are likely to take precautions. However, you'll have a week or so, during which time Gosseyn should discover you."

"And when he does?" Janasen was interested.

"Have him come to your apartment and give him this."

The thing tumbled out of the darkness glittering, as it fell, like a white flickering flame. It lay on the grass shining like a mirror in sunlight.

"It won't seem so bright in daytime," said the Follower. "Remember, it must be given to him in your room. Now, any questions?"

Janasen reached down gingerly and picked up the glowing object. It seemed to be a plastic card of some kind. It felt smooth and glassy. There was printing on it, which was too small for him to read with the naked eye.

"What is he supposed to do with this?"

"Read the message."

Janasen frowned. "And what will happen?"

"It is not necessary for you to know that. Just carry out my instructions."

Janasen pondered that, and then scowled. "You said a little while ago that *we* must take a chance. It looks to me as if I'm the only one who is taking any chances."

"My friend," said the Follower in a steely tone, "I assure you, you are wrong. But let us have no arguments. Any more questions?"

Actually, he told himself, he had never worried the slightest bit.

"No," said Janasen.

There was silence. Then the Follower began to fade. It was impossible for Janasen to decide just when that fade-out was complete. But presently he knew that he was alone.

Gosseyn looked down at the "card", then up at Janasen. The calmness of the man interested him because it provided an insight into the other's character. Janasen was a solipsist who had struck a balance with his neurosis by developing a compensatory attitude of immense boldness. It was a balance that had little survival value, since again and again it would depend on whether other stronger men would tolerate his insolence.

The setting of their face-to-face meeting was colorfully Venusian. They sat in a room that opened onto a patio, with young flowering shrubs just outside. It was a room with all conveniences including automatic delivery of food, automatic table cooking devices, which dispensed with the necessity of having a kitchen.

Gosseyn studied the hollow-cheeked man with hostile gaze. The task of finding Janasen had not been too involved. A few interplanetary messages—not obstructed this time—a quick canvassing of hotel roboregisters—and here was the end of the trail. It was Janasen who spoke first:

"The system on this planet sort of interests me. I can't get used to the idea of free food."

Gosseyn said curtly: "You'd better start talking. What I do to you depends entirely on how much you tell me."

The clear, blue, unafraid eyes stared at him thoughtfully. "I'll tell you everything I know," Janasen said at last with a shrug, "but not because of your threats. I just don't bother keeping secrets either about myself or anyone else."

Gosseyn was prepared to believe that. This agent of the Follower would be fortunate to survive another five years, but during that time he would maintain his self-respect. He made no comment, however, and presently Janasen began to talk. He described his relations with the Follower. He seemed to be quite candid. He had been in the secret service of the Greatest Empire, and somehow he must have come to the attention of the shadow-shape. He proceeded to give a word for word account of his conversations with the Follower about Gosseyn. In the end he broke off, and returned to his earlier statement:

"The galaxy," he said, "swarms with anarchistic ideas, but I've never before heard of them working. I've been trying to figure out how this non-artist . . . to . . . to—"

"Call it null-A," said Gosseyn.

"—this null-A stuff operates, but it seems to depend on people being sensible, and that I refuse to believe."

Gosseyn said nothing more. For this was sanity itself that was being discussed, and that could not be explained with words alone. If Janasen was interested, let him go to the elementary schools. The other must have realized his mood, for he shrugged again.

"Read the card yet?" he asked.

Gosseyn did not answer immediately. He'd already allowed his extra brain to "feel" the object. It was chemically active but not harmfully so. He had the impression that it was an absorbing material. Still, it was a strange thing, obviously some development of galactic science, and he had no intention of being rash with it.

"This Follower," he said finally, "actually predicted that I would go into that elevator about 9:28 a.m."

It was hard to credit. Because the Follower was not of Earth, not of the solar system. Somewhere out in the far reaches of the galaxy, this—being—had turned his attention to Gilbert Gosseyn. And pictured him doing a particular thing at a particular time. That was what Janasen's account implied.

The intricacy of prophecy involved was staggering. It made the "card" valuable. From where he sat he could see that there was print on it, but the words were unreadable. He leaned closer. Still the print was too small.

Janasen shoved a magnifying glass towards him. "I had to get this so I could read it myself," he said.

Gosseyn hesitated, but presently he picked up the card and examined it. He tried to think of it as a switch that might activate a larger mechanism. But what?

He looked around the room. At the moment of entering he had "memorized" the nearest electric sockets and traced live wires. Some ran to the table at which he sat, and supplied power to the built-in compact electronic cooking machine. Gosseyn looked up finally.

"You and I are going to stick together for quite a while, Mr. Janasen," he said. "I have an idea that you're going to be removed from Venus either by a ship or a 'Distorter' transporter. I intend to go with you."

Janasen's gaze was curious. "Don't you think that might be dangerous?"

"Yes," said Gosseyn with a smile. "Yes, it might be."

There was silence.

Gosseyn attuned the card to one of his "memorized" areas, and simultaneously, he made the action cue a simple fear-doubt. If the emotion of fear and doubt should enter his mind, the card would instantly be similarized out of the room.

The precaution was not altogether adequate, but it seemed to him he had to take the chance.

He focused his glass on the card, and read:

Gosseyn:

A "Distorter" has a fascinating quality. It is electrically powered, but shows no unusual characteristics even when it is on. Such an instrument is built into the table at which you are sitting. If you have read this far, you are now caught in the most intricate trap ever devised for one individual.

If the emotion of fear came, he did not recall it then or afterwards.

For there was night.

IV.

Abstracts

A child's mind, lacking a developed cortex, is virtually incapable of discrimination. The child inevitably makes many false evaluations of the world. Many of these false to facts judgments are conditioned into the nervous system on the "unconscious" level, and can be carried over to adulthood. Hence, we have a "well educated" man or woman who reacts in an infantile fashion.

The wheel glinted as it turned. Gosseyn watched it idly, as he lay in the cart. His gaze lifted finally from the gleaming metal wheel, and took in the near horizon, where a building spread itself. It was a wide structure which curved up from the ground like a huge ball only a small part of which was exposed to view.

Gosseyn allowed the picture to

seep into his consciousness, and at first he did not feel either puzzled or concerned. He found himself making a comparison between the scene before him and the hotel room where he had been talking to Janasen. And then he thought: *I am Ashargin.*

The idea was nonverbal, an automatic awareness of self, a simple identification that squeezed up out of the organs and glands of his body and was taken for granted by his nervous system. Not quite for granted. Gilbert Gosseyn rejected the identification with amazement that yielded to a thrill of alarm and then a sense of confusion.

A summer breeze blew into his face. There were other buildings beside the great one, outbuildings scattered here and there inside a pattern of trees. The trees seemed to form a kind of fence. Beyond them, a backdrop of unsurpassed splendor, reared a majestic, snow-capped mountain.

"Ashargin!"

Gosseyn jumped as that baritone yell sounded no more than a foot from his ear. He jerked around, but in the middle of the action caught a glimpse of his fingers. That stopped him. He forgot the man, forgot even to look at the man. Thunderstruck, he examined his hands. They were slender, delicate, different from the stronger, firmer, larger hands of Gilbert Gosseyn. He looked down at himself. His body was slim, boyish.

He felt the difference, suddenly, *inside*, a sense of weakness, a dimmer life force, a mix-up-edness of other thoughts. No, not thoughts. Feelings. Expressions out of organs that had once been under the control of a different mind.

His own mind drew back in dismay, and once again on a nonverbal level came up against a fantastic piece of information: "I am Ashargin."

Not Gosseyn? His reason tottered, for he was remembering what the Follower had written on the "card": "You are now caught . . . in the most intricate trap . . . ever devised." The feeling of disaster that came was like nothing else that he had ever experienced.

"Ashargin, you lazy good for nothing, get out and adjust the harness on the drull."

He was out of the cart like a flash. With eager fingers he tightened the loosened cinch on the collar of the husky, oxlike beast. All this before he could think. The job done, he crawled back into the cart. The driver, a priest in work garb, applied the whip. The cart jogged on, and turned presently into the yard itself.

Gosseyn was fighting for understanding of the servile obedience that had sent him scurrying like an automaton. It was hard to think. There was so much confusion. But at last a measure of comprehension came.

Another mind had once controlled this body. The mind of Ashargin.

J5=BATTLE OF THE SIXTH DECANT=

Unintegrated, insecure mind it had been. Dominated by fears and uncontrollable emotions that were imprinted on the nervous system and muscles of the body. The deadly part of that domination was that the living flesh of Ashargin would react to all that internal imbalance on the unconscious level. Even Gilbert Gosseyn, knowing what was wrong, would have scarcely any influence over those violent physical compulsions—until he could train the body of Ashargin to the cortical-thalamic sanity of A.

Until he could train it— "Is that it?" Gilbert Gosseyn asked himself. "Is that why I am here? To train this body."

Faster than his own questions, the flood of organic "thought" squeezed up into his brain—memories of that other mind. Ashargin. The Ashargin heir. The immense meaning of that came slowly, came dimly, came sketchily because there was so much that had happened. When he was fourteen, Enro's forces had come to the school he was attending. On that tense day he had expected death from the creatures of the usurper. But instead of killing him, they brought him back to Enro's home planet of Gorgzid, and placed him in the care of the priests of the Sleeping God.

There he labored in the fields, and hungered. They fed him in the morning like an animal. Each night he slept with a shuddering uneasiness longing for the morning that would bring the one meal a day that kept him alive. His identity as the Ashargin heir was not forgotten, but it was pointed out that old ruling families tended to thin away and become weak and decadent. In such periods the greatest empires had a habit of falling by default into the possession of masterful men like Enro the Red.

The cart rounded a clump of trees that ornamented a central portion of the grounds, and they came abruptly within sight of a skycar. Several men in black, priestly uniforms and one gorgeously arrayed individual stood in the grass beside the plane, and watched the approach of the cart.

The work priest leaned back in agitation, and nudged Ashargin with the blunt end of his whip, a hurriedly brutal gesture. He said hastily:

"Down on your face. It's Yeladji himself, Watcher of the Crypt of the Sleeping God."

Gosseyn felt a violent jerk. He flipped over, and crashed to the bottom of the cart. He was lying there, dazed, as it slowly penetrated to him that the muscles of Ashargin had obeyed the command with automatic speed. The shock of that was still running its course when a strong, resonant voice said:

"Koorn, have the Prince Ashargin enter the plane, and consider yourself dismissed. The prince will not be returning to the work camp."

Once more, the obedience of

Ashargin was on an all-out basis. His sense blurred. His limbs moved convulsively. Gosseyn recalled collapsing into a seat. And then the skycar began to move.

It was all as fast as that.

Where was he being taken? It was the first thought that came when he could think again. Gradually, the process of sitting relaxed Ashargin's tensed muscles. Gosseyn made the A cortical-thalamic pause, and felt "his" body loosen even more. His eyes came into focus, and he saw that the plane was well off the ground, and climbing up over the snow-capped peak beyond the temple of the Sleeping God.

His mind poised at that point like a bird arrested in midflight. Sleeping God? He had a vague memory of other "facts" Ashargin had heard. The Sleeping God apparently lay inside a translucent case in the inner chamber of the dome. Only the priests were ever allowed to look inside the case at the body itself, and then only during initiation, once in each individual's lifetime.

Ashargin's memory reached that far. And Gosseyn had as much as he wanted. It was a typical variation of a pagan religion. Earth had had many such, and the details didn't matter. His mind leaped on to the vastly more important reality of his situation.

Obviously, this was a turning point in the career of Ashargin. Gosseyn looked around him with a gathering awareness of the possibilities of what was here. Three black-uniformed priests, one at the control—and Yeladji. The Watcher of the Crypt was a plumpish man. His clothes, which had seemed so dazzling, resolved on closer inspection into a black uniform over which was draped a gold and silver cloak.

The examination ended. Yeladji was number two priest in the Gorgzid hierarchy, second only to Secoh, religious overlord of the planet on which Enro had been born. But his rank and his role in all this meant nothing to Gilbert Gosseyn. He seemed a distinctly minor character in galactic affairs.

Gosseyn glanced out of the window. Still mountain below— In the act of glancing down, he realized for the first time that the clothes he had on were not normal for Ashargin, the farm laborer: An officer's dress uniform of the Greatest Empire—gold-braided trousers and pullover coat with jeweled lapels—exclusive with the highest ranking members of the general staff, the like of which Ashargin had not seen since he was fourteen, and that was eleven years before.

A general! The greatness of the rank startled Gosseyn. His thoughts grew clearer, sharper. There must be some very important reason why the Follower had put him here at this turning point in the career of the Ashargin heir—without his extra brain and helpless in a body

that was controlled by an unintegrated nervous system.

If it was a temporary state, then it was an opportunity to observe a facet of galactic life such as might never have come his way normally. If, on the other hand, escape from this "trap" depended on his personal efforts, then his role was even clearer. Train Ashargin. Train him at top speed by Ā methods. Only in that way could he ever hope to dominate his unique environment —in possession of a body not his own.

Gosseyn drew a deep breath. He felt amazingly better. He had made his decision. Made it with determination and with a reasonably full knowledge of the limitations of his position. Time and events might add new facets to his purpose, but so long as he was—imprisoned—in Ashargin's nervous system, that training must be first in all his plans. It shouldn't be too hard.

The passive way that Ashargin accepted the flight fooled him. He leaned across the aisle toward Yeladji.

"Most noble Lord Watcher, where am I being taken?"

The assistant head priest turned in surprise. "Why, to Enro. Where else?" he said.

Gosseyn had intended to watch the journey, but his ability to do so ended at that moment. Ashargin's body seemed to melt into a formless jelly. His vision blurred into the myopic blindness of terror.

The jar of the plane landing shocked him back to a semblance of normalcy. On trembling legs, he clambered out of the plane, and saw that they had landed on the roof of a building.

Eagerly, Gosseyn looked around. It seemed important that he get a picture of his surroundings. He realized he was out of luck. The nearest edge of the roof was too far away. Reluctantly, he let the three young priests direct him towards a staircase that led down. He caught a glimpse of a mountain far to his left—thirty, forty miles away. Was that the mountain beyond which lay the temple? It must be, for he could see no corresponding mountain range anywhere else.

He walked with his escort down three broad flights of stairs, and then along a bright corridor. They paused before an ornate door. The lesser priests stepped back. Yeladji came slowly forward, his blue eyes glittering.

"You will go in alone, Ashargin," he said. "Your duties are simple. Every morning, exactly at this hour—eight o'clock, Gorgzid city time—you will present yourself at this door, and enter without knocking."

He hesitated, seemed to consider his next words, and then went on with a prim note in his voice:

"It shall never be any concern of yours what his excellency is doing when you come upon him, and this applies even if there is a lady in the room. To such incidents

you literally pay no attention. Once inside, you will place yourself completely at his disposal. This does not mean that you will necessarily be required to do menial work, but if the honor of performing some personal service for his excellency is requested of you, you will do it instantly."

The positivity of command went out of his manner. He grimaced as if in pain, and then smiled graciously. It was a lordly gesture of condescension intermixed with a slight anxiety, as if all this that had happened was unexpected. And there was even the suggestion that the Watcher of the Crypt regretted certain actions which he had taken against Ashargin as a matter of discipline. He said:

"As I understand it, we now part company, you and I, Ashargin. You have been brought up with a strict regard for your rank, and the great role which is now thrust upon you. It is part of our creed that the first duty of man to the Sleeping God is that he learn humility. At times you may have wondered if perhaps your burden was not too great, but now you can see for yourself that it was all for the best. As a parting admonition, I want you to remember one thing: From time immemorial it has been the custom of new princes such as Enro to exterminate rival royal houses root, stock and branch. But you are still alive. That alone should make you grateful to the great man who governs the largest empire in all time and space."

Once more, a pause. Gosseyn had time to wonder why Enro *had* left Ashargin alive; time to realize that this cynical priest was actually trying to make him feel grateful; and then:

"That is all," said Yeladji, "Now, enter!"

It was a command, and Ashargin obeyed it in the all-out fashion that Gosseyn could not resist. His hand snatched forward. He grasped the knob with his fingers, turned it, and pushed the door open. He stepped across the threshold.

The door closed behind him.

On the planet of a far sun, a shadow thickened in the center of a gray room. It floated finally above the floor. There were two other conscious people in that narrow chamber, separated from each other and from the Follower by thin, metal grilles—but the shadow shape paid them no attention. He glided instead over to a cot on which lay the inert body of Gilbert Gosseyn.

He bent close, and seemed to listen. He straightened finally. "He's alive," he said aloud.

He sounded baffled, as if something had happened which was not within the purview of his own plans. He half-turned to face the woman through the bars that separated them—if a faceless thing could confront any one. He asked:

"He arrived at the time I predicted?"

The woman shrugged, then nodded sullenly.

"And he's been like this ever since?" His resonant voice was insistent.

This time the woman did not answer directly. "So the great Follower has run up against someone who doesn't conform."

The shadowy substance trembled, almost as if he was shaking off her words. His reply was a long time in coming. "It is a strange universe—out there," said the Follower finally. "And here and there, on the myriad planets, are individuals who, like myself have a unique faculty that lifts them above the norm. There is Enro"—and now here is Gosseyn."

He stopped, then said softly as if he was thinking out loud, "I could kill him this instant by hitting him over the head or by knifing him or by any one of a dozen methods. And yet—"

"Why don't you?" The woman's tone taunted him.

He hesitated. "Because . . . I don't know enough." His voice grew cold and decisive. "And besides I don't kill people I might be able to control. I shall be back."

He began to fade, and presently he was gone from the squalid, cement room where a woman and two men were imprisoned in cells that were separated from each other by a thin, fantastic network of metal.

Gosseyn-Ashargin found that he had entered a large room. At first sight, it seemed to be filled with machinery. To Ashargin, whose education had ended when he was fourteen, the picture was all confusion. Gosseyn recognized mechanical maps and videoplates on the walls, and almost everywhere he looked were "Distorter" instrument boards. There were several devices which he had never seen before, but he had so sharp a scientific comprehension that the very way in which they were fitted with the other machines gave him an inkling of their purpose.

This was a military control room. From here Enro directed, as much as one man could, the inconceivably large forces of the Greatest Empire. The videoplates were his eyes. The lights that twinkled on the maps could theoretically provide him with an over-all picture of any battle situation. And the very quantity of the "Distorter" equipment suggested that he tried to maintain a tight control over his far-flung empire. Perhaps he even had a linked system of "Distorter" transport whereby he could go instantly to almost any part of his empire.

Except for the fixtures, the great room was empty and unguarded.

There was a large window in one corner, and Gosseyn raced for it. A moment later, he was standing looking from a height down at the city Gorgzid.

The capitol of the Greatest Empire glittered below him in the

rays of its bright blue sun. Gosseyn remembered with Ashargin's memory that the old capitol of Nirene had been leveled by atomic bombs, and that the entire area that had once been a city of thirty million was a radioactive desert.

The recollection startled Gosseyn. Ashargin, who had not witnessed the scenes of destruction on that nightmarish day, was indifferent to it with the thoughtless indifference of people who cannot imagine an unobserved disaster. But Gosseyn stiffened before the details of one more major crime that Enro had committed. The deadly thing was that this one individual had now plunged the galactic civilization into a war that was already vast beyond all imagination. If Enro could be assassinated—

His heart pattered. His knees started to buckle. Swallowing, Gosseyn made the A pause, and halted Ashargin's frightened reaction to the hard purpose that formed like a flash in Gosseyn's mind.

But the purpose stayed. It stayed. The opportunity that was here was too tremendous for anything or anyone to stand in its way. This faintheart must be persuaded, must be cajoled, built up, propagandized into making one supreme effort. It could be done. The human nervous system could be whipped up into ecstatic effort and unlimited sacrifice.

But he'd have to watch out. At the moment the assassination was consummated, there would be danger of death, and there might even be the problem of a return to his own brain.

He stood there, eyes narrowed, lips compressed with determination. And felt the difference within the body of Ashargin, the gathering strength as that utterly different type of thought changed the very metabolic processes of the glands and organs. He had no doubt about what was happening. A new, stronger mind was in possession of this frail body. It was not enough, of course. Not by itself. A training of muscle and nerve co-ordination was still needed. But the first step was taken. He had made an irrevocable decision.

Kill Enro—

He gazed out on the city Gorgzid with a genuine interest. And thought of it as the city of gardenlike hills. It looked like a government city. Even its skyscrapers were covered with lichens and climbing "ivy"—it seemed to be ivy—and the roots were built with old-fashioned towers and odd slopes that appeared to crisscross each other. Of the city's fourteen million inhabitants, four-fifths of the working population occupied key positions in government buildings that had direct liaison with "work" offices on other planets . . . About five hundred thousand inhabitants — Ashargin had never learned the exact figure—were hostages who lived sulkily in the remote green suburbs. Sulkily, because they considered Gorgzid a provincial city and felt themselves insulted— Gosseyn could see some of the houses

in which they lived, magnificent homes hidden among trees and evergreen shrubbery, homes that straddled entire hilltops and crept down into the valleys, and were lost in the mists of distance.

Gosseyn turned slowly away from the vista that spread there. For more than a minute, odd sounds had blurred from beyond a door on the opposite wall. Gosseyn walked towards it, conscious that he had already delayed longer than was good for a first morning. The door was shut, but he opened it firmly, and stepped across the threshold.

Instantly, the sound filled his ears.

V.

Abstracts

Because children—and childlike grownups—are incapable of refined discrimination, many experiences shock their nervous systems so violently that psychiatrists have evolved a special word for the result: trauma. Carried over into later years, these traumas can so tangle an individual that unsanity—that is, neurosis—or even insanity can result. Almost every one has had several traumatic experiences. It is possible to alleviate the effect of many shocks with psychotherapy.

It took a moment, then, to accept the picture. He was in a large bathroom. Through a door to his right, partly open, he could see half of an enormous bed in an alcove at the far corner of a tremendous bedroom. There were other doors leading from the bathroom, but they were closed. And, besides, after one glance, Gosseyn brought his mind and his gaze out of the bedroom, and back to the scene that spread before him.

The bathroom was built of mirrors—literally. Walls, ceiling, floor, fixtures—all mirrors, so perfectly made that wherever he looked he saw images of himself getting smaller and smaller but always sharp and clear. A bathtub projected out from one wall. It, too, was made of mirrors. It curved rakishly up from the floor to a height of about three feet. Water poured into it from three great spouts, and swirled noisily around a huge, naked, red-haired man who was being bathed by four young women. It was the man who looked up. He saw Gosseyn, and waved the women out of the way.

They were alert, those young women. One of them turned off the water. The others stepped aside. As silence settled over the bathroom, the bather sat back with pursed lips and narrowed eyes, and studied the slim Gosseyn-Ashargin. The strain of that examination on Ashargin's nervous system was terrific. A dozen times, by an effort of will, Gosseyn made the Ā cortical-thalamic pause. He had to do it, not merely to retain control, but for the simple, basic purpose of keeping Ashargin's body from losing con-

sciousness. The situation was as desperate as that.

"What I'd like to know," said Enro the Red slowly, "is what made you pause in Control Center and look out of the window? Why the window?" He seemed intent and puzzled. His eyes were without hostility, but they were bright with the question he had asked. "After all, you've seen the city before."

Gosseyn couldn't answer. The direct interrogation was threatening to dissolve Ashargin into a flabby jelly. Grimly, Gosseyn fought for control, as Enro's face took on an expression of sardonic satisfaction. The dictator stood up and climbed out of the tub onto the mirrored tile of the floor. Smiling faintly, a remarkable muscular figure of a man, he waited while the women wrapped a gigantic towel around his dripping body. That towel was removed, and then he was dried by small towels vigorously wielded. Finally, a robe the color of his flaming hair was held for him. He slipped into it, and spoke again, still smiling:

"I like women to bathe me. There is a gentleness about them that soothes my spirit."

Gosseyn said nothing. Enro's remark was intended to be humorous, but like so many people who did not understand themselves he merely gave himself away. The whole bathing scene here was alive with implications of a man whose development to adulthood was not complete. Babies, too, loved the feel of a woman's soft hands. But most babies didn't grow up to gain control of the largest empire in time and space. And the way Enro had sat in his bath, aware of what Gosseyn-Ashargin was doing in the adjoining room, showed that—no matter how immature he was on the one hand—a part of his constitution had attained comparatively superior state. How valuable that quality would be in an emergency remained to be seen.

For a moment, standing there, he had forgotten Ashargin. It was a dangerous lapse. The direct remark by Enro about the women had been too much for his unstable nervous system. His heart quickened, his knees shook and his muscles quivered. He staggered and would have fallen if the dictator had not signaled to the women. Gosseyn saw the movement out of the corner of his eyes. The next second, firm hands had caught him.

When Gosseyn could stand again, and see clearly again, Enro was striding through one of two doors in the left wall into a room that was bright with sunlight. And three of the women were in the act of leaving the bathroom by the partly open bedroom door. Only the fourth young woman continued to brace his quivering body. The muscles of Ashargin started to shrink away from her eyes, but just in time Gosseyn made the "pause". It was he who realized that her gaze was not contemptuous but pitying.

"So this is what's been done to you," she said softly. She had gray eyes and classically beautiful features. She frowned, then shrugged. "My name is Nirene—and you'd better get in there, my friend."

She started to shove him toward the open door through which Enro had disappeared, but Gosseyn was in control again. He held back. He had already been struck by her name.

"Is there any connection," he said, "between Nirene the girl and Nirene the old capitol?"

Her frown grew puzzled. "One moment you faint," she said. "The next you ask intelligent questions. Your character is more complicated than your appearance suggests. But now, quick! You must —"

"What does my appearance suggest?" asked Gosseyn.

Cool, gray eyes studied him. "You asked for it," she said. "Defeated, weak, effeminate, childlike, incapable." She broke off impatiently, "I said, hurry. I meant it. I'm not staying another minute."

She whirled around. Without looking back, she walked swiftly through the bedroom door, and shut it behind her.

Gosseyn made no attempt at speed. He was not enjoying himself. And he felt tense whenever he thought of his own body. But he was beginning to get a picture of what he must do if he—and Ashargin—were to survive the day without being utterly disgraced.

Hold back. Delay reactions in the Ā fashion. It would be learning in action, with its many disadvantages. He had a conviction that for many hours, still, he'd be under the watchful, measuring eyes of Enro, who would be startled by any sign of self-control in the man he had tried to destroy. That couldn't be helped. There'd be unpleasant incidents as it was, enough perhaps to persuade even the dictator that all was as it should be.

And the moment he got into whatever room he was given, he'd make

an all-out attempt to "cure" Ashargin by A methods.

Walking forward slowly, Gosseyn passed through the door beyond which Enro had disappeared. He found himself in a very large room where under an enormous window a table was laid for three. He had to take a second look before he estimated the size of the window at a hundred feet high. Waiters hovered around, and there were several distinguished-looking men with important documents held limply in their fingers. Enro was bending over the table. As Gosseyn paused, the dictator lifted one after the other the gleaming covers from several dishes, and sniffed at the steaming food underneath. He straightened finally.

"Ah," he said, "fried mantoll. Delicious." He turned with a smile to Ashargin-Gosseyn. "You sit over there." He indicated one of the three chairs.

The knowledge that he was to have breakfast with Enro did not surprise Gosseyn. It fitted with his analysis of Enro's intentions toward Ashargin. Just in time, however, he realized that the young man was beginning to react in his terrible, self-conscious manner. He made the cortical-thalamic pause. And saw that Enro was staring at him, thoughtfully.

"So Nirene is taking an interest in you," he said slowly. "That's a possibility I hadn't considered. Still, it has it's aspects. Ah, here is Secoh."

The new arrival passed within a foot of Gosseyn, and so his first look at the man was from the side and the rear. He was dark-haired, about forty years old and very good-looking in a sharp-faced manner. He wore a single-piece, form-fitting blue suit with a scarlet cloak neatly draped over his shoulder. As he bowed to Enro, Gosseyn already had the impression of a foxlike man, quick, alert, and cunning. Enro was speaking:

"I can't get over Nirene talking to him."

Secoh walked to one of the chairs. and took up a position behind it. His keen black eyes glanced at Enro questioningly. The latter explained succinctly what had passed between Ashargin and the young woman.

Gosseyn found himself listening in amazement. Here it was again, the dictator's uncanny ability to know what was going on where he could neither see nor hear in a normal fashion.

The phenomenon changed the direction of his thoughts. Some of the strain on Ashargin lifted. For a moment, then, he had a picture of this vast environment of galactic civilization, and of the men who dominated it.

Each individual had some special qualification. Enro could "see" into adjoining rooms. It was a unique skill, and yet it scarcely justified the height of power it had helped him to attain. At first sight it

seemed to prove that men didn't need much of an edge over their fellows to gain ascendancy over them.

Secoh's special position seemed to derive from the fact that he was religious overlord of Gorgzid, Enro's home planet. Madrisol of the League was still an unknown quality.

Finally, there was the Follower, whose science included accurate prediction of the future, a gadget for making himself insubstantial and which gave him such control of other people's minds that he had imposed Gilbert Gosseyn's upon Ashargin's. Of the three men, the Follower seemed the most dangerous. But that also had yet to be shown. Enro was speaking again.

"I have half a mind to make her his mistress," he said. He stood scowling, then his face lighted. "By heaven, I will." He seemed suddenly in good humor, for he began to laugh. "That ought to be something to see," he said. Grinning, he told an off-color joke about the sexual problems of certain neurotics, and finished on a more savage note, "I'll cure that female of any plans she has."

Secoh shrugged, and then said in a resonant voice, "I think you're overestimating the possibilities. But it won't hurt to do as you suggested." He waved imperiously at one of the attendants. "Make a note of his excellency's request," he ordered in a tone of assured command.

The man bowed abjectly. "Already noted, your excellency.

Enro motioned to Gosseyn. "Come along," he said. "I'm hungry." His voice grew bitingly polite. "Or would you like to be assisted to your chair?"

Gosseyn had been fighting the Ashargin body's reactions to the import of Secoh's "request". Fighting successfully, it seemed to him. He walked toward the chair, and he was taking up his position behind it when the sharpness of Enro's tone must have penetrated to Ashargin. Or perhaps it was a combination of overpowering events. Whatever the cause, what happened was too swift for defense. As Enro seated himself, Ashargin-Gosseyn fainted.

When he returned to the conscious state, Gosseyn found himself sitting at the breakfast table being held in place by two waiters. Instantly, the body of Ashargin cringed, expecting censure. Startled, Gosseyn headed off the potential collapse.

He glanced at Enro, but the dictator was busily eating. Nor did the priest as much as glance at him. The waiters let go of his arms and began to serve him. The food was all strange to Gosseyn, but as each dish cover in turn was lifted, he felt a favorable or unfavorable reaction inside him. For once the unconscious compulsions of the Ashargin body had their uses. Within a minute or so he was eating food that was familiar and satisfying to the taste buds of Ashargin.

He began to feel shocked at what had happened. It was hard to participate in such a humiliating experience without feeling intimately a part of the disaster. And the worst part was that he could do nothing immediately. He was caught in this body, his mind and memory superimposed on the brain and body of another individual, presumably by some variation of Distorter similarity. And what was happening meantime to the body of Gilbert Gosseyn?

Such possession of another body could not be permanent—and, besides, he must never forget that the system of immortality which had enabled him to survive one death would protect him again—not permanent. Therefore, this was a tremendously important incident. He must savor it, try to understand it, be aware of everything that went on.

"Why," he thought in wonder, "I'm here at the headquarters of Enro the Red, the reigning overlord of the Greatest Empire. Actually eating breakfast with him."

He stopped eating, and stared at the big man in abrupt fascination. Enro, of whom he had heard vaguely through Thorson and Crang and Patricia Hardie. Enro, who had ordered the destruction of Ā because it would be the simplest method of starting a galactic war; Enro, dictator, leader, caesar, usurper, absolute tyrant, who must gain some of his ascendancy by his ability to hear and see what was going on in nearby rooms. Rather a good-looking man in his way. His face was strong, but it was slightly freckled, which gave him a boyish appearance. His eyes were clear and bold, and blue in color. His eyes and mouth looked familiar, but that must be an illusion—Enro the Red, whom Gilbert Gosseyn had already helped to defeat in the solar system, and who was now waging the vaster galactic campaign. Failing an opportunity to assassinate the man, it would be a fantastic achievement to discover here in the heart and brain of the Greatest Empire, a method of defeating him.

Enro pushed his chair away from the table. It was like a signal. Secoh immediately ceased eating, though there was still food on his plate. Gosseyn put down his own fork and knife, and guessed that breakfast was over. The waiters began to clear the table. Enro climbed to his feet, and said briskly:

"Any news from Venus?"

Secoh and Gosseyn stood up, Gosseyn stiffly. The shock of hearing the familiar word at this remote distance from the solar system was personal, and therefore controlled. The jittery nervous system of Ashargin did not react to the name "Venus".

The priest's thin face was calm. "We have a few more details. Nothing that matters."

Enro was intent. "We'll have to take some action about that planet,"

he said slowly. "If I could be sure Reesha was not there—"

"That was only a report, your excellency."

Enro whirled, his expression grim. "The mere possibility," he said, "is enough to hold my hand."

The priest was equally bleak. "It would be unfortunate," he said coldly, "if the League powers discovered your weakness, and spread the report that Reesha was on any one of thousands of League planets."

The dictator stiffened, hesitated for a moment. Then he laughed. He walked over and put his arm around the smaller man's shoulder.

"Good old Secoh," he said sarcastically.

The Temple lord squirmed at the touch, but bore it for a moment with a distasteful expression on his face. The big man guffawed. "What's the matter?"

Secoh withdrew from the heavy grasp, gently but firmly. "Have you any instructions to give me?"

The dictator laughed once more, then swiftly he grew thoughtful. "What happens to that system is unimportant. But I feel irritated every time that I remember Thorson was killed there. And I would like to know how we were defeated. Something went wrong."

"A Board of Inquiry has been appointed," said Secoh.

"Good. Now, what about the battle?" Briskly.

"Costly but progressively decisive. Would you care to see the figures of losses?"

"Yes."

One of the attending secretaries handed a paper to Secoh, who passed it silently over to Enro. Gosseyn watched the dictator's face. The potentialities of this situation were becoming vaster every moment. This must be the engagement which Crang and Patricia had referred to, nine hundred thousand warships —fighting the titanic battle of the Sixth Decant.

Decant? He thought in a haze of excitement: "The galaxy is shaped like a gigantic wheel—" Obviously, they had divided it into "Decants". There'd be other methods of locating the "latitude" and "longitude" of planets and stars of course, but—

Enro was handing the paper back to his adviser. There was a pettish expression on his face, and his eyes were sulky.

"I feel indecisive," he said slowly. "It's a personal feeling, a sense of my own life force not having been fulfilled."

"You have more than a score of children," Secoh pointed out.

Enro ignored that. "Priest," he said, "it is now four sidereal years since my sister, destined by the ancient custom of the Gorgzid to be my only legal wife, departed for—where?"

"There is no trace." The lean man's voice had a remote quality. Enro gazed at him somberly, and said softly:

"My friend, you always were

taken with her. If I thought you were withholding information—" He stopped, and there must have been a look in the other's eyes, for he said hastily, with a faint laugh, "All right, all right, don't be angry. I'm mistaken. It would be impossible for a man of your cloth to do such a thing. Your oaths, for one thing." He seemed to be arguing with himself.

He looked up bleakly, and said: "I shall have to see to it that of the children of my sister and myself—yet to be born—the girls are not educated in schools and on planets where the dynastic principle of brother-sister marriages is derided."

No reply. Enro hesitated, staring hard at Secoh. He seemed unaware for the moment that others were witnessing the interchange. Abruptly, he changed the subject.

"I can still stop the war," he said. "The members of the Galactic League are nerving themselves now, but they'll almost fall over themselves to give me my way if I showed any willingness to stop the battle of the Sixth Decant."

The priest was quiet, was calm, was steady. "The principle of universal order," he said, "and of a universal State transcends the emotions of the individual. You can shirk none of the cruel necessities." His voice was rocklike. "None," he said.

Enro did not meet those pale eyes. "I am undecided," he repeated. "I feel unfulfilled, incomplete. If my sister were here, doing her duty—"

Gosseyn scarcely heard. He was thinking gloomily, *So that's what they're telling themselves. A Universal State, centrally controlled, and held together by military force.*

It was an old dream of man, and many times destiny had decreed a temporary illusion of success. There had been a number of empires on Earth that had achieved virtual control of all the civilized areas of their day. For a few generations then, the vast domains maintained their unnatural bonds—unnatural because the verdict of history always seemed to narrow down to a few meaningful sentences: "The new ruler lacked the wisdom of his father—" "Uprisings of the masses—" "The conquered states, long held down, rose in successful rebellion against the weakened empire—" There were even reasons given as to why a particular state had grown weak.

The details didn't matter. There was nothing basically wrong with the idea of a universal state, but men who thought thalamically would never create anything but the outward appearance of such a state. On Earth A had won when approximately five per cent of the population was trained in its tenets. In the galaxy three per cent should be sufficient. At that point, but not till then, the universal state would be a feasible idea.

Accordingly, this war was a fraud. It had no meaning. If successful, the resultant universal state would last possibly a generation, possibly two. And then, the emo-

tional drives of other unsane men would impel them to plotting and to rebellion. Meanwhile, billions would die so that a neurotic could have the pleasure of forcing a few more high-born ladies to bathe him every morning.

The man was only unsane, but the war he had started was maniacal. It must be prevented from developing— There was a stir at one of the doors, and Gosseyn's thought ended. A woman's angry voice sounded:

"Of course, I can go in. Do you dare to stop me from seeing my own brother?"

The voice, in spite of its fury, had a familiar ring in it. Gosseyn whirled, and saw that Enro was racing for the door at the far end, opposite the great window.

"Reesha!" he shouted, and there was jubilance in his voice.

Through the watering eyes of Ashargin, Gosseyn watched the reunion. There was a slim man with the girl, and as they came forward, Enro carrying the girl in his arms and hugging her fast against his dressing gown, it was that slim man who drew Gosseyn's fascinated gaze.

For it was Eldred Crang. Crang? Then the girl must be—must be— He turned and stared, as Patricia Hardie said peevishly:

"Enro, put me down. I want you to meet my husband."

The dictator's body grew rigid. Slowly then, he set the girl down, and slowly turned to look at Crang. His baleful gaze met the yellowy eyes of the A detective. Crang smiled, as if unaware of the other's immense hostility. Something of his tremendous personality was in that smile and in his manner. Enro's expression changed ever so slightly. For a moment he looked puzzled, even startled, then he parted his lips and he seemed on the point of speaking when, out of the corner of his eyes, he must have caught a glimpse of Ashargin.

"Oh," he said. His manner altered radically. His self-possession returned. He beckoned Gosseyn with a brusque gesture. "Come along, my friend. I want you to act as my liaison officer with Grand Admiral Paleol. Tell the admiral—" He began to walk toward a nearby door. Gosseyn trailed him, and found himself presently in what he had previously identified as Enro's military control room. Enro paused before one of the "Distorter" cages. He faced Gosseyn.

"Tell the admiral," he repeated, "that you are my representative. Here is your authority." He held out a thin, glittering plaque. "Now," he said, "in here." He motioned at the cage.

An attendant was opening the door of what Gosseyn had already recognized as a transport "Distorter". Gosseyn walked forward, nonplussed. He had no desire to leave Enro's court just now. He hadn't yet learned enough. It seemed important that he remain and learn more. He paused at the cage door.

"What shall I tell the admiral?"

The other's faint smile had broadened. "Just who you are," Enro said suavely. "Introduce yourself. Get acquainted with the staff officers."

"I see," said Gosseyn.

He did see. The Ashargin heir was being exhibited to the military men. Enro must expect opposition from high-ranking officers, and so they were to have a look at Prince Ashargin—and realize how hopeless it would be for them ever to build up resistance around the only person who would have any legal or popular position. He hesitated once more.

"This transport will take me straight to the admiral?"

"It has only one control direction either way. It will go there, and it will come back here. Good luck."

Gosseyn stepped into the cage without another word. The door clanged behind him. He sat down in the control chair, hesitated for a moment—after all, Ashargin wouldn't be expected to act swiftly—and then pulled the lever.

Instantly, he realized that he was free.

VI.

Abstracts

Children, immature adults and animals "identify". Whenever a person reacts to a new or changing situation as if it was an old and unchanging one, he or she is said to be identifying. Such an approach to life is aristotelian.

Free. That was the tremendous fact. Free of Ashargin. Himself again. Odd how he knew that. It seemed to grow out of the very elements of his being. His own transport experience with his extra brain made the transition *feel* familiar. Almost, he was aware of the movement. Even the blackness seemed incomplete, as if his brain did not quite, not quite, stop working.

Even as he came out of the darkness, he sensed the presence of a powerful electric dynamo and of an atomic pile. And simultaneously, with intense disappointment, realized that they were not near for him to make use of them, or control them, in any way.

Quickly, then, he came to consciousness. As vision returned, he saw that he was neither in the Venusian apartments of Janasen, nor in any place to which Enro would have sent Ashargin.

He was lying on his back on a hard bed staring up at a high, concrete ceiling. His eyes and his mind absorbed the scene in one continuous glance that followed through. The room he was in was small. A needle-studded grille came down from the ceiling. Beyond it, sitting on a bunk watching him was a distinguished-looking young woman. Gosseyn's eyes would have paused, would have stared, but there was another metal grille on the other

side of her cell. In it, sprawled on a bunk, seemingly asleep, was a very large man who was naked except for a pair of discolored sport shorts. Beyond the giant was concrete wall.

As he sat up, more intent now, Gosseyn saw that that *was* the scene. Three cells in a concrete room, three windows, one in each cell, at least fifteen feet above the floor, no doors. His summing up stopped short. No doors? Like a flash, he ran his gaze along the walls searching for cracks in the cement. There were none.

Quickly, he went over to the bars that separated his cell from the woman's. Quickly, he "memorized" a portion of the floor of his own cell, then of hers, and then of the cell of the sleeping colossus. Finally, he tried to "similarize" himself back to one of his safety points on Venus.

Nothing happened. Gosseyn accepted the implications. Between distant points there was a time lag, and in this case the twenty-six hour period during which a "memorized" area remained similarizable had been used up. Venus must be immensely far away.

He was about to make a more detailed survey of his prison when once more he grew aware of the woman. This time his attention held. His first fleeting impression had been of someone whose appearance was very distinctive. Now, with measured glance, he saw that his picture was correct.

The woman was not tall, but she held herself with an air of unconscious superiority. Unconscious. That was the telling reality. What the conscious mind of an individual thought was important only insofar as it reflected or helped to anchor the "set" of the nervous system. The only comparison Gosseyn could think of was Patricia Hardie, who so suprisingly had turned out to be the sister of the mighty Enro. She also had that pride in her eyes, that automatic innate conviction of superiority—different from the Ā trained Venusians, whose dominant characteristic of complete adequateness seemed part of their body and their faces.

Like Patricia, the stranger was a *grande dame*. Her pride was of position and rank, of manners and —something else. Gosseyn stared at her with narrowed eyes. Her face showed that she acted and thought thalamically, but then, so did Enro and Secoh, and so had virtually every individual in history before the development of Ā.

Emotional people could build up their talents along one or two channels, and achieve as greatly as any Ā Venusian in a particular field. Ā was *the* system of integrating the human nervous system. Its greatest value was social and personal.

The important thing about assessing this woman was that, as he studied her, the extra component of the neural vibrations that flowed from her seemed to take on greater proportions with each passing moment.

She was dark-haired, with a head that seemed a shade too large for her body, and she returned his gaze with a faint, puzzled, anxious yet supercilious smile.

"I can see," she said uneasily, "why the Follower has taken an interest in you." She hesitated. "Perhaps you and I could escape together."

"Escape?" echoed Gosseyn. And looked at her with steady eyes.

The woman sighed, then shrugged. "The Follower is afraid of you. Therefore this cell cannot be quite as much of a prison to you as it is to me. Or am I wrong?"

Gosseyn didn't answer that, but he felt grim. Her analysis was wrong. He was as completely a prisoner as she was. Without an outside point to which he could similarize himself, without a power socket before his eyes to "memorize" he had no resources.

He studied the woman with a faint frown. As a fellow prisoner, she was theoretically an ally. As a lady of "quality", and, possibly, an inhabitant of this planet, she might be very valuable to him. The trouble was that she was very likely an agent of the Follower. And yet, he had a conviction that a fast decision was needed here.

The woman said: "The Follower has been in here three times wondering why you didn't wake up when you first arrived more than two days ago. Have you any idea?"

Gosseyn smiled. The idea that he would be giving out information struck him as naive. He was not going to tell anyone that he had been in the body of Ashargin, although surely the Follower, who had put him there—

He stopped. He felt himself grow taut. He thought, almost blankly, *But that would mean—*

He shook his head in wonder, and then stood in a blank amazement. Because—because if the Follower had lost control of him, that would indicate the existence of still another being of enormous power. Not that that was out of the question. He must never forget his theory. Somewhere out here were the players of this mighty game. And even a "queen", such as he had estimated himself to be, could be moved or forced, checked and endangered, or even "taken" and removed from the board.

He parted his lips to speak, but restrained himself. His slightest word would be noted and analyzed by one of the sharp and dangerous minds of the Galaxy. He pondered for a moment, and came back to his own first question. Aloud, he said:

"Escape?"

The woman was sighing. "It seems incredible," she said. "A man whose movements cannot be predicted. Up to a point, I have a clear picture of what you're going to do, then, because one of those actions is without logic, I get only blur."

Gosseyn said: "You can read the

future—like the Follower?" He was intent. He walked to the bars, separating their two cells, and stared down at her in fascination. "How is it done? And what am I going to do? And where are we, anyway? Who is this Follower, who has the appearance of a shadow?"

The woman laughed. It was a slightly tolerant laugh, but it had a musical note in it that was pleasing to the ear. The laughter ended.

"You're in the Follower's *Retreat,* of course," she said, and frowned. "I don't understand you," she complained. "And your questions. Are you trying to mislead me? Who is the Follower? Why, everyone knows that the Follower is an ordinary Predictor who discovered how to put himself out of phase."

There was an interruption. The giant in the third cell stirred on his cot, and sat up. He stared at Gosseyn.

"Get over to your bunk," he said in a bass voice, "And don't let me catch you talking to Leej again. Now, get!"

Gosseyn did not move, simply watched the other with curious eyes.

The stranger climbed to his feet, and came over to the bars of his cell. On the cot he had looked like a giant. Now, for the first time, Gosseyn realized how big the man really was. He towered. He spread. He was seven and a half feet tall, and as broad as a gorilla. Gosseyn estimated his chest at eighty inches.

He was taken aback. He had never seen such an enormous man before. The giant exuded abnormal physical power. For the first time in his life, Gosseyn felt himself in the presence of an untrained individual whose sheer muscular strength visibly exceeded the possibilities of a normal A.

"Better back down fast," the monster said in a menacing voice. "The Follower told me she's mine, and I don't intend to have any competition."

Gosseyn glanced questioningly toward the woman, but she had lain down with her face to the wall. He faced the giant again.

"What planet is this?" he asked conversationally.

His tone must have been right, because the giant lost some of his belligerence.

"Planet?" he said. "What do you mean?"

That was startling. Gosseyn, whose mind had leaped ahead, devising other questions, teetered and came back. Was it possible that he was in another isolated planetary system similar to that of Sol? The probability shook him.

"The name of your sun?" he urged. "Surely, you have a name for it. It must have been assigned a recoghition symbol in the galactic nomenclature."

The other's mood chilled visibly.

His blue eyes misted with suspicion. "What are you trying to pull off?" he asked roughly.

Gosseyn said grimly: "Don't try to pretend that you don't know the planets of other suns are inhabited by human beings."

The huge man looked disgusted. "Got yourself a little addled in the brain, haven't you?" he said significantly. "Look," he went on, "my name is Jurig. I live on Crest, and I'm a Yalertan citizen. I killed a man by hitting him too hard, and so here I am, subject to execution —but I don't want to talk to you any more. You bother me with that foolishness."

Gosseyn hesitated. Jurig's protests were convincing, but he wasn't prepared to let the matter drop. There was one point that needed clearing up.

"If you're so innocent," he said accusingly, "how is it that you can speak the English language so perfectly?"

He realized the answer to that as he spoke the word "English". Jurig completed the thought with finality.

"*What* language?" he said. He began to laugh. "You are crazy." He seemed to realize the implications of what he was saying. He groaned. "Is it possible the Follower has put me in here with a crazy man?"

He caught hold of himself. "Man," he said, "whoever you are —the language we're speaking, you as well as I, is Yalertan. And I can tell you right now, you speak it like a native."

For a few minutes then, Gosseyn abandoned the conversation. He walked to his bunk, sat down. The flow of neural sensations that

streamed from the giant were not friendly. There was cunning in them, and a kind of smug *murderous* self-satisfaction.

The question was, why did the man dissemble? In point of muscular strength, the Yalertan was in a class by himself. If they ever came to grips, then Gilbert Gosseyn would have to use his extra brain to "similarize" himself to various parts of the prison. He must keep clear of those gorillalike arms and fight like a boxer, not a wrestler.

But any use of his extra brain would reveal the nature of his special ability. Gosseyn climbed to his feet, and walked slowly over to the grille that divided his cell from that of Leej. He recognized that his position was bad. The cell had no power sockets. He was caught in it as completely as if he was the most ordinary of human beings.

The bars of the grille were thin, and about four inches apart. They looked as if a strong man might be able to bend them.

No strong man in his right mind would ever try. The metal was incrusted with needles. Thousands of them. He drew back, defeated, then bent down and examined the connection of the grille with the floor.

There was a crossbar that was free of needles, but the needles from the horizontal bars reached down over it, guarding it from probing fingers. Gosseyn straightened, and turned to his one remaining hope, the cot. If he could move it against the wall, end up, he'd be able to reach the window.

The cot was a metal affair, its legs cemented into the concrete floor. After several minutes of straining at it vainly, Gosseyn stood back. *A doorless cell,* he thought, *and silence.* His mind paused. The silence was not complete. There were sounds, movements, rustlings, a faint throb of voices. This prison must be part of a larger building—what was it the woman had called it—the Follower's *Retreat.* He was trying to visualize that when Jurig said from behind him:

"Funny clothes you got on."

Gosseyn turned and stared at the man. Jurig's tone indicated that he had made no connection between the clothing and what Gosseyn had said about other planets.

He glanced down at his "funny" suit. It was a light, plastic coverall with hidden zipper and—also hidden—a thermostat controlled heating and refrigeration network that was mazed evenly through the artificial textile material. Very neat and expensive looking it was, and very handy to have on, particularly for a man who might find himself in an unaccustomed climate. In cold or hot weather, the suit would maintain a uniform temperature next to his skin.

The shock of realizing that he had been using a foreign language so naturally, so easily, that he hadn't even been aware of it—had come at

the moment that he tried to fit the word "English" into the Yalertan tongue. It had sounded wrong. He'd gathered from Thorson and Crang that the galactic civilization had developed language "machines" by which soldiers, diplomats and space travelers could be taught the tongues of the peoples of far planets. But he hadn't pictured anything like this.

The "card" must have done it. Gosseyn sank down on his cot, and closed his eyes. He had really been trapped in Janasen's room. Imagine actually sitting on a "Distorter". *In one instant,* he thought, *I was transported from Venus. My body headed unerringly for this cell, and arrived at a predetermined instant. In midflight, another "player" in this vast game, "similarized" my brain into the brain case of Ashargin on a far planet. The moment that connection was broken, I woke up here, already educated in the local language. And, if the Follower really expected me to awaken the moment my body arrived, then I must have been taught the language during or immediately after the time that I looked at the "card".*

He glanced again at the woman, but her back was still turned. He looked at Jurig appraisingly. Here must be his immediate source of information.

The big man answered his questions without hesitation. The planet was made up of thousands of large islands. Only the skytrailer people, the Predictors, could move freely over the entire surface. The rest of the population was confined, each individual group to its own island. There was trade among them, and some migration, but always on a limited scale as between nations. There were numerous trade and immigration barriers but—

Gosseyn listened with the attention of a man who was swiftly grasping at a new idea. He was trying to imagine the null-A Venusians against these Yalertans. He tried to think of a comprehensive word that would describe the Predictors—but nothing seemed to fit. Neither side yet realized that two utterly different systems for dealing with reality existed in the galaxy. Neither side had as yet become aware of the other. Both were systems that had developed in isolation from the main stream of galactic civilization. Both were now about to be drawn into the maelstrom of a war being fought on so vast a scale that entire planetary systems might be wiped out.

He commented finally: "You seem to dislike these Predictors. Why?"

The giant had wandered away from the bars of his cell, and was leaning against the wall under the window. "Are you kidding?" he said. His eyes narrowed with annoyance, and he came back to the bars. "You've pulled enough of that stuff for one day."

"I'm not kidding. I really don't know."

"They're stuck up," said Jurig

abruptly. "They can tell the future, and they're ruthless."

"That last point sounds bad," Gosseyn admitted.

"They're all bad." Explosively. Jurig stopped and swallowed hard. "They enslave other people. They steal the ideas of the island folk. And because they can tell the future, and so never make a mistake in timing, they win every battle and repress every rebellion.

"Listen!" Jurig leaned closer to the bars in front of him. His tone was earnest. "I noticed you didn't like my saying that Leej belonged to me. Not that it matters what you like, you understand. But don't ever feel sorry for one of them. I've seen these women flay alive some lesser being"—his voice grew sarcastic, then angry—"and get a kick out of it. Now, this one has run up against the Follower for a private reason, and so, for the first time in centuries—I never heard of any other—one of us lesser folk has a chance at last to get back a little at these murderous scum.

"Am I going to take advantage of that? You bet I am."

For the first time since she had turned her back, the young woman stirred. She swung around, sat up, and looked at Gosseyn.

"Jurig's neglected to mention one thing," she said.

The giant let out a bellow. His lips drew back in a snarl. "You tell him," he raged, "and I'll smash in your teeth, the moment we get together."

The woman flinched visibly, and there was no question of her fear. Her voice when she spoke, trembled, but there was defiance in it, too.

"He's supposed to kill you the moment the bars are removed," she said.

Jurig's face was a study. "All right for you, my fine lady. That finishes you."

The woman was white. "I think," she said shakily, "The Follower wants to see how well you can defend yourself." She stared at him appealingly. She said: "What do you think? Can you do anything?"

It was a question that Gosseyn was urgently asking himself.

Gosseyn had an impulse to reassure the young woman, but he suppressed it. He had no intention of standing by while Jurig's bloodthirsty threats were carried out, but he must never forget that somewhere beyond these drab walls was an alert observer—and that his every movement, word and action would be carefully weighed and analyzed.

"Can you do anything?" she asked, "or is the Follower worried about you without reason?"

"What I'd like to know," countered Gosseyn, "is, what action do you foresee me taking?"

Her answer proved, if it was necessary to prove it, that this was no academic argument. Without warning, she burst into tears.

"Oh, please," she sobbed, "don't keep me in suspense. That man's

threats are driving me insane." She shook her head tearfully. "I don't know what's the matter. When I look into your future, everything blurs. The only time that ever happens is with the Follower, and with him it's natural. He's simply out of phase."

She broke off, wiped her tears with the back of her hand, and said earnestly: "I know you're in danger, too. But if you can do anything against the Follower you'll have to be able to do it in the open."

Gosseyn shook his head. He felt sorry for the woman, but her logic was wrong. In the history of the planet that I come from, surprise has been a major factor in determining what countries and groups shall dominate civilization."

All the tears were gone now from her eyes, and her gaze was steady again. "If the Follower can defeat you in the open, he can baffle any surprise system you may have."

Gosseyn scarcely heard. "Listen," he said earnestly, "I'm going to try to help you, but whether I can or not depends on how you answer my questions."

"Yes?" She sounded breathless, her eyes wide, her lips parted.

"Have you any picture at all of my future actions?"

"What I see you doing," said Leej, "doesn't make sense. It just doesn't make sense."

"But what is it?" He felt exasperated. "I've got to know."

"If I told you," she said, "it would introduce a new factor and change the future."

"But maybe it should be changed."

"No." She shook her head. "After you do it everything blurs. That gives me hope."

Gosseyn controlled himself with an effort. Anyway it was something. The implication was that his extra brain was going to be used. Apparently, whenever that happened this system of prediction failed to function.

Their faculty remained remarkable, and he'd have to try to find out how neurotics like this woman could automatically foretell the future. But that was for later.

"Look," said Gosseyn, "when does all this happen?"

"In about ten minutes," said Leej. And Gosseyn was shocked into temporary silence. Finally, he said:

"Is there any kind of transport between Yalerta and the planets of other stars?"

"Yes," said Leej. "Without warning, without previous knowledge on our part, the Follower informed all the skytrailer people that they must accept commissions on military spaceships of some being who calls himself Enro. And immediately he had a ship here with some method for transporting us."

Gosseyn took the shock of that without change of expression, but he flinched inwardly. He had a sudden picture of seers on every

warship foretelling the future actions of enemy warships. How could any normal human being fight such a superhuman crew? He had known from what Janasen had said that the Follower was working with Enro—but that was one individual. Here were reinforcements by the— He asked the question in a piercing tone:

"How many . . . how many of you are there?"

"About five million," said Leej.

He had guessed more than that, but the lesser figure brought him no sense of relief. Five million was enough to dominate the galaxy.

"Still," said Gosseyn, hoping aloud, "they won't all go."

"I refused," said Leej in a flat tone. "I'm not the only one, I understand, but I've talked against the Follower for five years, and so I'm to be made an example of." She sounded weary. "Most of the others are going."

Gosseyn estimated that four of the ten minutes were gone. He wiped his damp forehead, and pressed on.

"What about the accusations Jurig made against the Predictors?"

Leej shrugged listlessly. "I suppose they're true. I remember a silly girl in my service talked back to me, and I had her whipped." She looked at him, her eyes wide and innocent. "What else can you do with people who don't know their place?"

Gosseyn had almost forgotten the man, but now he was forcibly reminded. There was a roar of outrage from the cell beyond the woman.

"You see," yelled the giant. "See what I mean?" He paced the floor. "Just wait till these grilles go up, and I'll show you what you can do with people who don't know their place." He raised his voice in a frenzied shout. "Follower, if you hear me, let's get some action. Pull up these grilles. Pull 'em up."

If the Follower heard, he showed no sign. The grilles did not go up. Jurig subsided and retired to his cot. He sat there muttering the words, "Just wait! Just wait!"

For Gosseyn, the waiting was past. Jurig, in his outburst, had given him the clue to the action he must take. He realized he was shaking, but he didn't care. He had his answer. He knew what he was going to do. The Follower himself would supply the opportunity at the moment of crisis.

No wonder Leej had disbelieved her advance picture of his future action. Apparently, it would be a meaningless move.

Crash! The interrupting sound came as he was settling back onto the cot. A metallic sound.

The grilles were lifting.

TO BE CONTINUED

THE HERO

BY JOSEPH FARRELL

***The** first men to reach the Moon and return are natural set-ups as heroes. But the best laid plans can become strangely confused, the most obvious situations unacceptable—*

Illustrated by Orban

"McRorty," said General Duval, "you are drunk."

The old watchman peered at the general from under his red lids. There was an alcoholic dignity in his straightforward gaze, and a pleasant devil-may-care numbness in his brain. So Duval was top man on this hushed-up project. A good guy, Duval—one of those rare humans who somehow get into the policy-making brass.

But why should Duval bawl him out? So he'd had a few, and so what? He was on the job, wasn't he?

For a moment an appropriate retort hesitated on his lips, then he decided against it. He rather liked this job, with its Buck Rogers atmosphere of rocketships that blasted confidently into the void—and didn't come back. Correction—a few came back, but those twisted, battered things, and their occupants—

"Just had two, sir," he assured the general. "I felt my leg starting to act up again, and just a little drop or two seems to help it. But I'm perfectly sober, sir. Just—"

"No doubt," said the general, dryly. "I've suggested on previous occasions that you find a less drastic anaesthetic to ease the pain in your leg, whatever it is. I'm afraid, McRorty, that we can't carry you any longer. The Rocket Field, after all, harbors some of America's most important scientific knowledge, even military secrets. Agents of foreign powers are constantly seeking information, and we can't afford a weak spot."

His tone softened. "I'm sorry, Tim, but I'll have to discharge you. I'll call Finance, and you can come back for your pay this afternoon—they'll take care of you."

The general turned to leave, then hesitated and faced McRorty again. His hand went out, squeezed the watchman's briefly. "Good luck, Tim," he said.

The sun was well above the horizon now, in this equatorial plateau, and was illuminating the area known

optimistically as the "Rocket Field." Tim McRorty took his last look, eying with almost personal pride the sleek black form of Plan VIII, latest in the series of men's efforts to invade outer space. Plan VIII was scheduled for its trial that very afternoon, a dashing young test pilot ready to follow those who had never returned.

Sometimes McRorty daydreamed about taking one of those metallic monsters out into space for humanity's first successful flight. But he had to be really drunk to dream of something like that. Only absolute physical perfection would do for a rocket pilot, and he, a genuine, unquestioned physical wreck, sagged with the weight of many gin-soaked years.

He unfolded the piece of paper Duval had left in his palm. A ten dollar bill. Duval was a good skate at that. He shoved the ten into a pocket and put out a thumb as a truck started up.

In town, McRorty fingered the bill in his pocket and regarded the short main street glumly. The day was warm and it would be hard sleeping, especially since he had managed a few hours during the night. A few drinks would be necessary to induce slumber. In fact, a few drinks would be appropriate anyway. He crossed the street and entered Murphy's saloon.

At the bar, he did some serious thinking. On ten dollars, a man can drink a lot of beer, and still have some money left. With whiskey a ten spot goes fast, and with no job, he'd have to economize.

"Shot and a beer," he told the bartender.

As the glasses were being filled, McRorty looked around to see what the place had to offer in the way of companionship. Only one other customer was at the bar, a youthful major wearing the rocket patch. McRorty looked again with surprise. He knew the man well and hadn't thought to find him standing moodily at a bar. Steve Boleski was not the type.

McRorty tossed down his first drink and moved up alongside the major. Boleski came out of his fog as the old watchman came up alongside him.

"Oh—hello, Tim. Have a drink. How come you're not working?"

"Just got fired." He gestured toward the bottle the bartender was pouring from, explanation enough. "Have one yourself."

Boleski shook his head. "No, I'm just passing time. I have a job this afternoon, you know—"

McRorty knew. In the pleasing numbness that was creeping through his mind, he knew quite well. Over the glass he caught Boleski's eye. The major was a perfect specimen of a man—physically, mentally, emotionally. He had passed all the tests the medics could throw at him, passed them well enough to be one of the few considered fit to man a rocket.

The others had been perfect specimens, too. McRorty let them pa-

rade by in his mind. Saunders was the first—a rather serious lad who yet had eager eyes and a ready smile. Bonini, the Brooklyn boy, ready to tackle anything, including a space rocket. Bill Holmes, whose iron nerve and unlimited energy had earned him the right to go into space. And die.

Saltzer, all guts and drive—the daredevil *par excellence*. And Christoffersen and Morgan and Dineen. There was a certain something they had in common. One after the other they went into space in better and better rockets, and glad of the chance. Each a perfect specimen. Now Steve Boleski's turn had come.

Boleski toyed with the change the bartender had spread out beside his half-filled glass. McRorty, temporarily tongue-tied, watched him pile the coins up. The half dollar as a base. Then the two quarters, carefully deposited in the exact center of the larger coin. Four nickels above that, then five dimes. . . .

"Beautiful job, that Eight," McRorty ventured.

"Yeah." Boleski's hand paused above the piled coins. The hand was rock-steady. "Beautiful job. Six hours from now I'll crawl into it and be off for a trip around the Moon. Can't miss, Mac. Just like leaving LaGuardia in a clipper. Be all routine a few years from now."

He lifted his glass abruptly and emptied it in a swift motion. He gazed levelly at McRorty.

"I'm scared, Mac," he admitted. "So scared I'd gladly change places with you. Have a drink for me at about five this afternoon. And think of me. I'll be an hour out from Earth then. Out far enough so I'll be the first man ever to see Earth as a globe except maybe Saltzer and the others. All alone in space. Did you ever think, Mac, of how it must be to be all alone in space?"

McRorty grunted and called for a refill. The flier made no protest as he watched the bartender pour another for him. Both men pushed change forward; the bartender took Boleski's.

For a minute they drank in silence. McRorty put his down neat, with a brief swallow of beer; the flier stirred his into the soda and sipped it. Boleski broke the silence:

"Not that I'd back out. I'd go through with this if I were twice as scared. I'll get into that space-going fuel tank and grin at the newsreel men as if I didn't have a nerve in my body. Fearless Boleski, they'll call me, and pin a medal of honor on my chest. Or on my father's chest—posthumously. And all the time I'll be wishing I was still working in my father's tailor shop."

"Good boy," McRorty murmured. "Finish that up and have one on me."

"Uh-uh. I have to start for the field soon."

"You can stand another, Stevie. Have one on the trip. And how

about a ride to the field? Gotta pick up my pay!"

The flier obligingly waited while McRorty had two more, then led the old watchman out. In the major's car, they headed for the rocket field. At the wheel, Boleski was quiet, regarding the road ahead pensively. McRorty stowed away in the torn lining of his coat the fifth he had picked up, and continued pouring out his heart to his companion.

"You're all right, Stevie. Good boy. You'll drive that rocket around the Moon tonight and come right back to Earth."

Boleski smiled a small, rather bleak smile.

"And don't worry 'bout being scared, Stevie. Everybody gets scared. A young fellow like you got the stuff. Now, if you were a worthless old rum-dum like me—"

His eyes widened a little as a brilliant thought came to him.

"Stevie," he said, "I got an idea. Wonderful idea. Just came to me."

He paused, and waited for the flier to respond to his bait. When he received no answer, he went on:

"If *I* die, Stevie, nobody will care one way or the other. With you, it's different. You got everything to live for. So here's my idea. I'll take your place! I'll fly the rocket!"

"Thanks, Pop," said Boleski, laughing. "But that's my job. You wouldn't want me to quit now, would you?"

"No, no, Stevie." McRorty was having trouble putting his thoughts into words. Also, his tongue was working hard to keep the words intelligible. "You ain't quittin', Stevie. See, I'll take your place, and—"

"Forget it, Mac." Boleski put a friendly hand on McRorty's shoulder. "I appreciate your offer, but I'm not that scared. You're a good guy, but let it go at that."

McRorty didn't push the point; a small voice was convincing him that the army brass might not see the beautiful logic of his plan. He could not quite imagine General Duval shaking his hand and wishing him *bon voyage*.

The gates of the compound were in sight in the distance. McRorty fingered the bottle inside his coat and mulled over the sad facts of his life.

"I'd like to go out in a big way," he announced. "Most of the guys around here think I'm an old bum without any imagination. But I got a brain in my head, Stevie, and I can figure what it's like out there in space. If I could just see that once, I wouldn't mind crashing on the Moon."

Boleski's lips widened in a humorless smile.

"I expect to die out there, Mac," he said. "When you see me sealed into that rocket, take a good look, because I'm not coming back. That I'm very sure of."

"You'll come back, Steve."

Slowly, Boleski shook his head.

"There's something they forgot, Mac. The boys on the drawing board knew their stuff. The mathematicians and the engineers and the mechanics have done a faultless job. That rocket is the cream of modern science. It's perfectly qualified to perform its function—to fly around the Moon with a passenger and return. There's even a wide margin of safety. But still I'm not coming back."

They were at the gates of the compound. Boleski waived a casual hand to the guard, and they passed through with challenge. He drove straight for the cluster of buildings ahead.

"I have a theory, Mac," he said. "I think that we poor Earth-bound humans are reaching too high.

Maybe my idea is corny, but think it out—a mere man in a little rocket-ship daring to invade the immensity of space. We're not big enough, Mac. We're not—"

He looked sidelong at McRorty.

"I'm talking too much. But the fact remains—the ships are perfect. They could take two, maybe three, on the trip. There's a wide margin of safety on oxygen, on moisture control, on parachute facilities for landing . . . oh, let it go. I'm just babbling."

But something he had said kept echoing in McRorty's mind. The rocket could take two or three men on the trip . . . there's a wide margin of safety . . . two men —

For a while he pondered morosely . . . two men . . . his mind was oiled to a fine working edge . . . a wide margin of safety.

He shook his head and glanced uncertainly at the flier. Then he shook his head again. It was a fantastic thought he was nurturing, and Boleski would laugh aloud. But—the ship could take two men.

The car was stopped, and Boleski was climbing out. McRorty shook hands and mumbled a swift goodby. Several high officers were approaching.

To those watching, it appeared as if McRorty was in earnest conversation with the flier.

The rocket would take two—

And when Boleski walked off to confer with the brass, the watchman swaggered up to the rocket with a look of importance he hadn't bothered to affect in years.

Men were coming and going irregularly, into and out of the rocket. Two dignified, smudge-covered scientists were crawling out of the giant jet. A crew was filling the oxygen tank, still a profanity-inspiring job despite improved apparatus. McRorty casually greeted a guard.

"Hi, Tony. The major wants me to bring his thermos in."

The bulge that was a whiskey bottle looked as if it might have been a thermos. And Tony had just seen the watchman ride in with the pilot. He nodded and promptly forgot about McRorty. Major Boleski was the man of the hour. If he wanted the old souse to carry his thermos bottle aboard the rocket, why not?

Mild confusion existed around the rocket. McRorty calmly climbed the ladder to the entrance. He was rather well shielded by staging. At the top he looked swiftly around, saw that he was scarcely visible from the ground, and stepped inside.

His heart was racing now. *The rocket would take two—*

Inside, he looked around with weakening resolution. There was no place to hide. Along one bulkhead of the curving compartment were all the instruments Boleski need use. He wasted little time looking at them. Overhead was a maze of short-wave and movie camera apparatus. A large, iron-rimmed

wheel caught his eye and he gazed at it in mild surprise.

The only concession to comfort was a couch. McRorty wondered why, since there would be no gravity when the ship went into space. Then he noticed that actually it was a long chest.

McRorty lifted the cover. Inside were tools and instruments of many kinds. Also there were several cylinders of oxygen.

He looked across to where other cylinders of oxygen were lashed down. A few minutes later there were more cylinders of oxygen lashed down, and McRorty was crawling into the chest.

His was an abbreviated, dehydrated little body, and he found that he could get the top down. For the present, he left it open, and fortified his waning courage by tapping the bottle.

Approaching voices caused him to burrow deeper into his hiding place, the lid in place above him. For a long time he lay there, painfully cramped, the air becoming increasingly more foul. Footsteps and voices persisted and once somebody actually sat on top of the chest and tapped his heels against the side.

How long he waited there, McRorty could not have said. A hundred times he started to throw up the cover to end the waiting game, then his determination somehow returned and he forced himself to hang on.

It semeed toward the end that his own labored breathing must give him away. His lungs worked frantically to gather the last impure molecules of oxygen that remained inside the chest. If he had figured the number of cubic feet of air in that container, and compared it with the amount needed to sustain human life for a period of, say, an hour, he would have known it was impossible to remain there as long as he did, and he probably would have suffocated from the knowledge.

His own breath was probably the worst part of it. He wished he had spent the day eating peppermints.

When he started losing in the struggle to keep from blacking out, he managed to push up the cover. It seemed to weigh a ton. Feebly, he lifted it and sweet, fresh air struck his anguished lungs.

It was only dimly that he saw Steve Boleski whirl around and fly to his feet. An expression of complete amazement was on the flier's face.

"McRorty! What-in-the-name-of—!"

For seconds, Boleski stared unbelievably at the blue face. McRorty coughed, an agonized rattle, and fell back.

Boleski, recovering his wits, lifted the cover and dragged the half dead wretch out of the chest.

"Of all the fool stunts . . . what a breath! No wonder you're choking! I have to get you out of here—"

At that moment, a muffled thun-

der sounded. The rocket vibrated smoothly. Boleski paused helplessly.

The rocket was lifting.

McRorty lifted himself to his knees. His head was whirling, and his lungs were still gasping for air and he wanted only to be permitted to die with no further exertion. He sensed dimly that the rocket was rising. The feeling was like being in a rising elevator, but he could hardly feel that there was any importance in that.

Dimly he saw Boleski standing before him. The flier's expression was a rare combination of anger and helplessness. He held a hand over his eyes and started to swear in a low monotone.

"McRorty, you idiot," he said finally. "You'll never live through this acceleration, especially after almost choking yourself to death. What a breath you have! It'll probably kill me before long!"

He shook his head in a beaten gesture and lifted McRorty by the armpits. He dropped the watchman into the only chair. He pointed at a needle that indicated two Gs and still was rising.

"That'll go up as the fuel burns and the ship lightens," he said. "We'll hit eight Gs and and then drop instantly to nothing. By that time I'll have a corpse on my hands. But I'll ease my conscience by giving you the best possible chance. Relax—relax completely."

That was not difficult. McRorty felt like a wet bar rag. He felt leather sliding over his face.

"Oxygen mask," Boleski explained, and continued to work. McRorty felt pressure against his legs. "Detachable blackout suit," Boleski was saying. "Now lie still and don't fight against it."

The pressure was becoming unbearable. McRorty saw the flier sprawl supine on the chest. His last memory before he blacked out was Boleski's steady, disgusted cursing.

When he awoke, he felt worse than he had ever felt in his life. For a while he lay there groaning, trying to think. Where was he? In an alcoholic ward again? No, it wasn't the D. T.'s this time. But why did he seem to be all strapped up?

Wearily, he dragged the oxygen mask from his face and tried to sit up. Boleski appeared from somewhere and released him. He sat for a while, not sure he was strong enough to get to his feet. His head felt light. In fact his whole body felt as if it were somewhere else—

Then he remembered. He was weightless! In space!

Boleski shouted as the old man started to jump up.

"Careful, Mac, careful! Hold on to something when you move around." The flier was strangely tense now, tense as McRorty had never thought to see him. "We've done it, Mac! We're in space! We've left the Earth behind!"

Silent, awed, the two men stared out into the Stygian infinity of the cosmos. An overwhelming impression of vastness beat in at them, a crushing infinitude that was exponential in its superiority to anything human thought ever had conceived.

Boleski was talking fast, almost babbling, the watchman vaguely noticed. McRorty was feeling better by the minute. Whether the lack of gravity was curing him, or —and it seemed more likely—the deific magnificence of which suddenly he seemed a part, he did not know.

"We'll look at Earth," Boleski was saying. "Earth, beautiful Earth. We'll see it again, Mac. I'll show it to you if you wait—"

The flier went on chatting. McRorty managed to turn and watched him braced against the iron-rimmed wheel he had noticed previously.

"The wheel," Boleski was saying, "weighs twenty kilograms. Ship weighs a thousand times as much. Thousand turns of the wheel makes the rocket turn completely around in the opposite direction. Clever idea."

McRorty eyed him in growing surprise. The flier's tone was becoming childish, and the gleam in his eyes was becoming wild, frantic. He swung the handle of the wheel as if his life depended on it. The revolution counter clicked steadily on. Soon the hazy edge of a giant globe came into view. Boleski, seeing this, swung the handle even more swiftly. Sweat was running down his forehead.

"There it is, Mac! Look at it! Earth! It's Earth, Mac! Do you hear me? It's—"

"Snap out of it, Stevie!" McRorty seized his arm and shook. But, in the absence of gravity, he shook himself harder than Boleski. "Steve, stop it!"

Boleski stopped chattering, but his silence was even more frightening. He stared with terrified eyes at the Earth which they now faced. McRorty felt some of the cosmic terror that seemed to be ruining the other man. It was an indescribable nostalgia—an Earthsickness that seemed to freeze something inside his chest. He closed his eyes, but even then the power of the cosmos beat into his mind. The Earth seemed to be shrinking even as they watched.

He forced himself back to the immediate problem. Boleski was getting worse. What to do? He reached suddenly for the bottle, passed it over.

"Take some of this, Steve. It'll make you feel better. Take it, Steve."

Boleski took the bottle. The liquid was reluctant to emerge, and he looked like a baby drinking a bottle of milk, but he managed to get several mouthfuls inside him. He passed it back. McRorty took it with every intention of having a good nip himself, but he hesitated

with it halfway to his lips. Somehow he just didn't want any.

"It's no use, Mac," the flier was saying. "It doesn't help any—that stuff or anything else you got. You see, I was right, Mac. Wasn't I, Mac? I said we were too small, too insignificant, to conquer space. Mac, I can't stand it, I tell you, I can't stand it—!"

McRorty backed away.

"Careful, Steve. Careful. I know what you mean, Steve. We're in the presence of a Power greater than ourselves and it's more than the human mind can bear. That's why the others didn't come back—the bravest men on Earth, Saltzer and Holmes and Bonini and the others—"

He stopped, puzzled by a sudden thought. The bravest men Earth could produce had been overcome by the superhuman grandeur of space. The finest physical and mental specimens the world could supply, all had been beaten.

But McRorty was not beaten.

True, he felt the Earthsickness keenly. As keenly, he thought, as Boleski did, and as the others must have felt it. But to him, after the first shock, had come a feeling of thankfulness. He seemed to have found the meaning of life, to have found something he had been seeking for many gin-soaked years.

"Stevie—don't!" The flier had started to scream. McRorty tried to hold him, found himself flung down hard. Stunned, he lay there, watching Boleski go to pieces. The flier alternately screamed and sobbed. At last his eye fixed on the iron wheel. He shouted and seized the handle, started pumping madly.

"Back to Earth—we're going back to Earth! This is the wheel that turns the other wheels, Pop—I just remembered there's a tunnel from here to the rocket field—we just have to walk through it—be home in five minutes—"

After a while he fell on his face and lay as if dead. McRorty collected clothing and wires, used them to tie him hand and foot in case of further trouble. Then he sat down and thought.

Automatically he reached for the bottle. For long minutes he stared at it, his mind almost blank. Then he looked for a place to dispose of it.

McRorty sat there, resigned, and waited. Either the rocket would do what it was supposed to do without his help, or one more rocket wouldn't come back. There were various buttons to be pushed, levers to be pulled, but for the most part they were unlabeled.

Actually, he didn't care much what happened. He would like to bring Boleski back to Earth, though. The poor lad had so much to live fore. In time he might learn to appreciate the great feeling of peace that could come in space to a tortured mind.

"And that's the whole story," Duval finished. "McRorty got them back. They landed hard, but alive.

We've hushed the whole thing up, and I've every confidence it can continue to be hushed up."

The other men were listening seriously. They seemed keenly interested in the matter, especially the rather weary-looking one to whom the others turned, as if for his opinion.

He was the President of the United States.

"But what," he asked, "is the explanation? I can understand that there is something about the glory of outer space that can shock a man, even drive him mad, but why would a physically perfect, entirely sane young man like Boleski be affected, and this . . . this old drunkard come out of it with no ill effects?"

A round little gray-haired man answered. "McRorty had a mind that was troubled, uncertain. He was full of unconscious tensions and vague desires that troubled him all his life. It all boils down to the fact that he became an alcoholic. McRorty has spent his life drinking because of the type of mind he has—he's been searching, as all people do, for security. Peace of mind. And he found it—out there. My opinion is that McRorty will never again feel the need for a drink."

He spread his hands. "Boleski had a perfectly normal mind, and that was his undoing. A perfectly normal mind—or what we call one—can accept any perfectly *normal* experience. McRorty lived in a different mental atmosphere—the world of the alcoholic. A world where anything can happen."

"Do you mean"—the President's voice was rather bitter—"that we have to conquer space with an army of drunkards?"

"Not at all, Mr. President. We can find acceptable types among nondrinkers. We'll develop screening tests that will produce a different kind of rocket pilot, and we can prepare them better for what they have to face. But, there's another point—"

"Yes, I know." Still bitterness in the voice. "We've sent the first manned rocket around the Moon, and the man who was in it will become a national—a world—hero. We have our choice between Boleski, who is hopelessly insane, and McRorty, who is impossible. There is only one thing to do."

He hesitated. "I will accept your assurance that McRorty has reformed and will not talk. And we will see that Steve Boleski is well taken care of. But our main responsibility is to the American people, and the American people are entitled to a hero who is neither mad nor drunk. A man who will be hero-worshiped by millions of kids must be the right man."

He faced them earnestly. "And so, the second rocket to the Moon must be the first. We have to find the right man to go in it. And Heaven help us if we choose wrong!"

THE END

UNITE AND CONQUER

BY THEODORE STURGEON

***Old** as human government is the fact that a disunited population will unite to repel the alien invader. But that was something the alien Invader hadn't counted on, perhaps!*

Illustrated by Orban

They were digging this drainage canal, and the timekeeper drove out to the end, where the big crane-dragline was working, and called the operator down to ask a lot of questions about a half-hour of overtime. Next thing you know, they were going round and round on the fill. The young superintendent saw the fight and yelled for them to cut it out. They ignored him. Not wanting to dirty his new breeches, the super swung up into the machine, loaded three yards of sand into the bucket, hoisted it high, swung and dumped it on the scrambling pair. The operator and the timekeeper floundered out from under, palmed sand out of their eyes and mouths, and with a concerted roar, converged on the cab of the machine. They had the super out on the ground and were happily taking turns at punching his head when a labor-foreman happened by, and he and his men stopped the fuss.

The red-headed youngster put down the book. "It's true here, too," he told his brother. "I mean, what I was saying about almost all of Wells' best science-fiction. In each case there is a miracle—a Martian invasion in 'War of the Worlds,' a biochemical in 'Food of the Gods,' and a new gaseous isotope in 'In the Days of the Comet.' And it ultimately makes all of mankind work together."

The brother was in college—had been, for seven months—and was very wise. "That's right. He knew it would take a miracle. I think he forgot that when he began to write sociological stuff. As Dr. Pierce remarked, he sold his birthright for a pot of message."

"Excuse me," said the dark man called Rod. He rose and went to the back of the café and the line of phone booths, while the girl with the tilted nose and the red sandals stared fondly after him. The Blonde arrived.

"Ah," she mewed, "alone, I see. But, of course." She sat down.

"I'm with Rod," said the girl with the sandals, adding primly, "He's phoning."

"Needed someone to talk to, no doubt," said the Blonde.

"Probably," said the other, smiling at her long fingers, "he needed to come back to earth."

The Blonde barely winced. "Oh well. I suppose he must amuse himself between his serious moments. He'll have one tomorrow night, you know. At the Ball. Pity I won't see you there. Unless, of course, you come with someone else—"

"He's working tomorrow night!" blurted the girl with the sandals, off guard.

"You could call it that," said the Blonde placidly.

"Look, Sunshine," said the other girl evenly, "why don't you stop kidding yourself? Rod isn't interested in you and your purely local color. He isn't even what you

want. If you're looking for a soulmate, go find yourself a wolfhound."

"Darling," said the Blonde appreciatively, and with murder in her mascara. "You know, you might get him, at that. *If* you brush up on your cooking, and if he can keep his appetite by going blind—" She leaned forward suddenly. "Look there. Who *is* that floozy?"

They turned to the back of the café. The dark young man was holding both hands of a slender but curvesome girl with deep auburn hair. She was laughing coyly up at him.

"Fancy Pants," breathed the girl with the red sandals. She turned to the Blonde. "I know whereof I speak. Her clothesline is right under my window, and—"

"The little stinker," said the Blonde. She watched another pretty convulsion of merriment. "Clothesline, hm-m-m? Listen—I had a friend once who had a feud on with a biddy in the neighborhood. There was something about a squirt gun and some ink—"

"Well, well," said the girl in the sandals. She thought a moment, watching Rod and the redhead. "Where could I get a squirt gun?"

"My kid brother has a water pistol. I got it for him for his birthday. Can you meet me here at seven o'clock?"

"I certainly can. I'll get the ink. Black ink. *India* ink!"

The Blonde rose. "Be sweet to him," she said swiftly, "so he won't guess who fixed Fancy Pants."

"I will. But not too sweet. The heel. Darling, you're wonderful—"

The Blonde winked and walked away. And at a nearby table, a gentleman, who had been eavesdropping shamelessly, stuffed a soft roll into an incipient roar of laughter, and then began to choke.

"Colonel Simmons," said the annunciator.

"Well for Pete's sake!" said Dr. Simmons. "Send him in. Send him right in! And—cancel that demonstration. No . . . don't cancel it. Postpone it."

"Until when, doctor?"

"Until I get there."

"But—it's for the Army—"

"My brother's the Army, too!" snapped the physicist and switched off.

A knock. "Come in. Leroy, you dog!"

"Well, Muscles." The colonel half ran into the room, gripped the scientist by the upper arms, scanned his face up, back and across. Their eyes were gray, the colonel's gray and narrow, the doctor's gray and wide. "It must've been—" they said in unison, and then laughed together.

"Eight years, anyway," said the colonel.

"All of that. Gosh, gosh." He shook his head. "You and your shiny buttons."

There was a silence. "Hardly know where to begin, what to say,

hm-m-m?" grinned the colonel. "What've you been doing lately?"

"Oh . . . you know. Applied physics."

"Hah!" snorted the colonel. "Question: Mr. Michaelangelo, what are you doing? Answer: Mixing pigments. Come on, now; what since you invented magnefilm?"

"Nothing much. Couple of things too unimportant to talk about, couple more too important to mention."

"Your old garrulous self, I see. Come on, Muscles. Security regulations don't apply here, and between us especially."

That's what you think, thought Dr. Simmons. "Of course not," he said. "What branch are you with now?"

"Publicly, the Air Corps," said the colonel, indicating his wings. "Actually, I'm on the Board of Strategy. This won't be the kind of war which can be fought with semipublic conferences and decisions after advisement in the General Staff. The Board operates practically underground, without any publicity, and without any delay."

"Board of Strategy, eh? I'd heard only vaguely . . . and I'm in a position to hear plenty. Well now. When you say 'No delay,' what do you mean?"

"I mean this," said the colonel. He put his hands behind him on a high lab table and lifted himself up on it. He crossed his bright boots and swung them. "We have plans . . . look; you know how M-Day plans work, don't you?"

"Certainly. The personnel of draft boards is all chosen, the questionnaires are printed and almost entirely distributed, the leases and domains of examination centers are arranged for, and so on and on. When mobilization is called, everything starts operating without a hitch. You hope," he added with a grin. "Why?"

"The Board operates the same way," said his brother. "But where Selective Service has only one big problem to arrange for in detail we have—" he shrugged. "Name your figure. We have planned what to do, if, for example, Russia attacks us, if we attack Russia, if France attacks Brazil, or if Finland takes a swing at Iraq. What's funny?"

"I was thinking of the legend about the emperor who tried to grant the reward asked for by a certain hero, who had stipulated simply that he be given some wheat, the amount to be determined by a hypothetical chessboard, putting one grain on the first square, two on the second, four on the third, eight on the fourth, and so on . . . anyway, it wound up with an amount equal to a couple of years' world supply, and with the empire and all its resources in the hands of our hero. Your plans are like that. I mean, if one of the possibilities you mention should occur, but if you should lose the third battle instead of winning it as scheduled, why, you'll have a whole new set of plans

to make. And this applies to every one of your original master-plans."

"Oh, don't misunderstand me. I don't mean that each plan is as detailed as the M-Day deal. Lord, no. The plans are policies of action, rather than blueprints. They stay within the bounds of statistical probability, though we push those bounds outward as far as possible. I've mentioned possible enemies, and possible combatants aside from enemies. There are also plans covering combinations and permutations of alliance. Anything is possible after such precedent, for example, as the situation in the Second War, when our close ally Russia was at peace with our worst enemy." He laughed. "If that happened in human instead of in international terms, with my closest friend lunching daily with a man who was openly trying to kill me, we'd call it fantastic. Maybe it is," he said cheerfully, "but it's most engrossing."

"You rather enjoy it, don't you?"

"I have never had such fascinating work in all my life."

"I didn't mean strategy, soldier-boy. I meant war."

"War? I s'pose it is. Now, another thing the Board is doing . . . wait a minute. Muscles! You're not still the dewy-eyed idealist you used to be—brotherhood of mankind, and all that, are you?"

"I invented the sonic disruptor, didn't I?" *You probably think that answers your question,* he thought bitterly.

"So you did. A very healthy development in you and in the noble art of warfare. Nicest little side arm in history. Busts a man all up inside without breaking the skin. So little mess."

Healthy! Dr. Simmons stared at his brother, who was looking into his cigarette case. *Healthy! And I developed the disruptor to focus ultrasonic vibrations under the skin, to homogenize cancerous tissue. I never dreamed they'd . . . ah, neither did Nobel.* "Go on about the Board," he said.

"What was I . . . oh yes. Not only have we planned the obvious things—political situations, international crises, campaigns and alliances, but we are keeping a very close watch on technology. The War Department has, at long last, abandoned the policy of fighting this war with last war's weapons. Remember how Hitler astonished the world with the elementary stunt of organizing liaison between his tanks and his dive bombers? Remember the difficulties they had in promoting the bazooka to replace the mortar in jungle warfare? And how the War Department refused to back the Wright Brothers? There'll be no more of that."

"You mean we're preparing to use the latest in everything? Really use it?"

"That's right. Atomic energy and jet propulsion we know about. Then there's biological warfare, both disease and crop-hormone tech-

niques. But it doesn't stop there. As a matter of fact, those things, and other proven developments, account for only a small part of our plans. We have the go-ahead on supplies, weapons, equipment and techniques which haven't even been developed yet. Some haven't even been invented yet!"

Dr. Simmons whistled. "Like what?"

The colonel smiled, rolled his eyes up thoughtfully. "Like impenetrable force-fields, mass-multipliers —that's a cute hypothesis, Muscles. Increase the effective mass of a substance, and the results could be interesting. Particularly if it were radioactive. Antigravity. Telepath scrambles, which throw interrupting frequencies in and around thought waves, if thoughts *are* waves . . . we've considered practically every gadget and gimmick in every story and article in every science-fiction magazine published in the last thirty years, and have planned what to do in case it suddenly pops up."

Ignoring all the utopian, philosophical, sociological stories, of course, thought Dr. Simmons. He said, "So your visit here isn't purely social?"

"Gosh no. I'm with the observation group which came here to see your Spy-Eye in action. What is it, anyhow? And how did it get the cute soapsuds name?"

Dr. Simmons smiled. "One of the armchair boys in the front office used to work in an advertising agency. The device is a 'Self-Propelled Information Interceptor'—SPII—which, once it touched that huckster brain, became 'Spy-Eye'. As to just what it is, you'll see that for yourself if you attend the demonstration, which starts as soon as we've finished talking."

"You mean you postponed it until I was through with you?"

"That's right." *I thought you'd like that,* he thought, watching the pleased grin on his brother's face. "Tell me something, Leroy. All these plans . . . are we at war?"

"Are we . . . well, no. You know that."

"But these preparations. All they lack is a timetable." He squinted quizzically. "By golly, I believe you have that, too."

"We have plenty," the colonel sidestepped, winking.

"Choose sides? What's the line-up?"

"I won't tell you that. No, I'm not worried about security! It's just that I might be wrong. Things move so fast these days. I'll tell you one thing, though. We already have our neutral ground."

"Oh yes, of course—like Switzerland and Sweden. I've always wondered what exact powers kept them neutral."

"Well, if you're going to fight a war, you've got to have some way to exchange prisoners and have meetings with various interested parties, and so on—"

"Yep. And it used to come in

pretty handy for certain manufacturers."

The colonel eyed him. "Are you sure you're off that lion-and-lamb kick?"

Dr. Simmons grimaced. "I think the Spy-Eye can answer that quite adequately."

The colonel slipped off his perch. "Yes, let's get to it," he said eagerly.

They went to the door. "By the way," said Dr. Simmons, "just what have you picked out for your neutral ground?"

"Japan," said the colonel.

"Nice of 'em to agree to anything so close to home."

"Nice of 'em? Don't be silly! It's the only way they can be sure it won't be fortified."

"Oh," said his brother. They went out.

The demonstration went off without a hitch, and afterward the six Army observers and the plant technicians repaired to the projection room for Dr. Simmons' summation.

He talked steadily and tiredly, and his thoughts talked on at the same time. As he reeled off specifications and characteristics, his mind rambled along, sometimes following the spoken thought, sometimes paralleling it, sometimes commenting acidly or humorously, always tiredly. It was a trapped thing, that talking mind, but it was articulate.

". . . five point eight feet long overall, an aerodynamic streamline, with its largest diameter only two point three seven feet. Slide One, please. As you have seen, it has one propelling and three supporting jets. These three are coupled directly to the same outlet-valve, which is controlled by an absolute altimeter. The whole is, of course, gyro-stabilized. It is capable of trans-sonic speeds; but it can very nearly hover, subject only to a small nutation which can probably be designed out."

It was going to be a mail-rocket, commented his thought.

"Its equipment includes the usual self-guiding devices, a coding flight-recorder, and radio receivers tuned to various preselected FM, AM, and radar channels. In regard to radar; should it pick up any radar pulses close enough or strong enough to suggest detection, it changes course and speed radically. Should they persist, the Spy-Eye releases 'window' — aluminum-foil strips of various lengths, and returns to its starting point by a preset and devious course.

"The spy device itself is relatively simple. It uses magnefilm, taking pictures of the source of any desired radio signal. When the signal is received, it locates the beam, aims the camera, and records the audio signal magnetically. Of course, the synchronization between the picture and the audio recording is perfect, because of the magnefilm."

"Will you explain magnefilm, please, doctor?"

"Certainly, captain. It was developed through research into the rather wide variation in dielectric characteristics of the early plastics —the styrenes, ureas, and so on. Molecular arrangement was altered in various plastics until a transparent conductor was developed. It was not very far from that to the production of a plastic with a remarkably high magnetic density. Once this was made in a transparent, strong, pliable form, it was simple to make photographic film of it. The audio impulses are impressed directly upon the film, as in any magnetic tape system." *And it was invented for 8mm movie addicts, so that they could have sound film*, added his thought. *Now it's a secret weapon.*

"The purpose of the Spy-Eye, of course, is to pick up short-range transmissions; vertically-beamed walkie-talkies, line-of-sight FM messages, and the like. Since these are usually well beyond the range of the enemy's listening-posts, they are seldom coded. Therefore, with this device, we have access to a wealth of intelligence that has so far been regarded as unreachable."

He signaled the projection room. The screen came to life. During the test, the various officers had spoken into the microphones of several AM and FM transmitters spotted within a quarter-mile. Unerringly, after a few spoken words, the screen showed the source and its identification numeral, painted on large white signboards.

"In enemy territory," remarked the doctor dryly, "we shall probably have to do without the boards." There was polite laughter. "If you will remember, gentlemen, the selector was next set to pick up something on the broadcast band."

The screen, blank, gave an agonized groan. Then a child's voice said clearly, "What's the matter, Daddy? Has that old acid indigestion got you down again?" "Owoo," said the man's voice. The screen suddenly showed, far below, the tall towers of a transmitting antenna. "Honey Child, you'd better go for the doctor. You're old Daddy's real poorly." "No need to be," rejoined the little angelic voice. "I took my ice-cream money and brought you a package of Bubble-Up, the fastest relief known to the mind of man. It is only ten cents at the nearest drugstore. Here. Take one and drink this glass of water I brought you." *Glug-glug. Clink!* "Ah-h! I'm a new man!" "Now Daddy, here's my report card. I'm sorry. It's all D's." "Ha ha ha! Think nothing of it, Honey Child. Here—take this dollar. Take five dollars! Take all the other kids down for a treat!"

"Cut!" said Dr. Simmons. "I would consider this conclusive evidence, gentlemen, that the Spy-Eye can spot a target for bombing."

Amid laughter and applause, the lights came on. The observers pressed forward to shake the physicist's hand. Colonel Simmons stood by until the rest went to a

table, where a technician was explaining the flight-record tapes and the course and radio-band pre-selector mechanisms.

"Muscles, it's fine. Just fine! How about duplication? I know there can be no leaks out of here, but do you think *they* will be able to figure it out quickly enough to get something like it into production?"

Dr. Simmons rubbed his chin. "That's hard to say. Aside from the fuel and the magnefilm, there's nothing new about the device except for the fact that old components are packed in a new box. The fuel can be duplicated, and magnefilm—well, that's a logical development."

"Well," said the colonel, "it can't matter too much. I mean, even if they have it already. We can blanket the earth with those things. There needn't be a single spot on the globe unobserved. The Spy-Eye doesn't have to detect radio alone, does it?"

"Lord, no! It could be built to seek infrared, or radioactivity, or even sound, though we'd have to tune the jets acoustically for that. The magnefilm's audio could pick up our own directional beams and get a radio fix on anything we wanted it to take pictures of. The camera could be triggered to a time mechanism, or to anything that radiated or vibrated. Likewise the hunting mechanism."

"Oh, fine," said the colonel again. "There'll be no power on earth that can't be spotted and smashed within hours, once we get enough of these things out."

"No power on earth," nodded his brother. "You have every reason to be confident." *And no reason to be right,* his silent voice added.

The first signs of the war to come were in all the papers. But hardly anyone read them. They were inside, with small headings. The front pages were more exciting that day. They screamed of new international incidents. The tabloids were full of a photo-series of the mobbing of a bearded man called Kronsky. (He was English—Somerset—and spoke the buzzing brogue of his shire. His name had been Polish, three generations before. He was wearing a beard because of scars caused by a severe attack of barber's itch. These facts were not touched upon.) An Estonian student was wrapped in a U.N. banner and stoned for having sung "Ol' Man River" at a folk-song recital. An astonishing number of tea-leaf readers were hired overnight by restaurants in which "Beef Stroganoff" suddenly became "Gypsy Goulash."

The small notices in the papers dealt with the startling discovery, by three experimenters, one in France and two in Canada, of a new noise in Jansky radiation, that faint hiss of jumbled radio frequencies which originates from somewhere in intersteller space. It was a triple blast of sound, each one two and two-fifths seconds in length, with

two and two-fifths seconds of silence between the signals. They came in groups, three blasts each, a few fractions of a second under ten minutes apart. The phenomenon continued for seven months, during which time careful measurements showed an appreciable increase in amplitude. Either the signal source was getting stronger, or it was getting nearer, said the pundits.

During these seven months, and for longer, the Simmons brothers lapsed into their usual "got to write to him some time" pattern in regard to each other. Both were busy. The colonel's life was a continuous round of conferences, research reports, and demonstrations, and the load on the physicist became heavier daily, as the demands of the Board of Strategy, stimulated by its research, its Intelligence Section, and the perilous political situation, reached his laboratories.

The world was arming feverishly. A few historians and philosophers, in their very few objective moments, found time to wonder what the political analysts of the future would have to say about the coming war. The First War was a war of economic attrition; the Second was too, but it was even more an ideological war. This incipient unpleasantness had its source in ide-

ology, but, at the eve of hostilities, the battle of philosophies had been relegated to the plane of philosophy. In practice, each side—or rather, *all* sides—had streamlined themselves into fighting machines, with each and every part milled to its function, and all control centralized. The necessary process of kindling fire to fight fire had resulted in soviets where the proletariat did not dictate, and in democracies where the people did not rule. Indeed, since the increase of governmental efficiency everywhere had resulted in a new high in production of every kind, the economic and political aspects of the war had been all but negated, and it began to appear as though the war would be fought purely for the sake of fighting a war, and simply because the world was prepared for it.

On December 7th, as if to perpetuate the memory of infamy, the first bomb was dropped.

It was *dropped.* It wasn't a self-guided missile. It wasn't a planted mine. It wasn't dust or bio, either; it was a blast-bomb, and it was a honey.

They got the ship that dropped it, too. A proximity-fused rocket with an atomic warhead struck it a glancing blow. That happened, spectacularly, over Lake Michigan. The ship, or what was left of it, crashed near Minsk.

It was Dr. Simmons' urgent suggestion which accounted for the ship. It had not been seen, but it had been spotted by radar on December 6th, when it encircled the Earth twice. It was far inside Roche's Limit; the conclusion was obvious that it was self-powered. Simmons calculated its orbit, knowing that at that velocity it could not alter its course appreciably in the few hours it took to pass and repass any given point. The proximity rocket was launched on schedule, not on detection. Unfortunately, on its way to its rendezvous with fission, the ship dropped its bomb.

And when that happened, the world drew itself together like . . . like— Ever see a cat lying sleeping, spread out, relaxed, and then some sound, some movement will put that cat on guard? It may not move a muscle, but it isn't relaxed any more; it isn't asleep any more. It has changed its pose from a slumber to a crouch, and you can only know that because of the new shape of its eyes. The world did that.

But nobody started throwing bombs.

"Cool down, soldier-boy!"

"Cool down, he says," fumed the colonel. "This is . . . this—" His words died into a splutter.

"I know, I know," said Dr. Simmons, trying not to grin. "You figured, and you figured, and you read all sorts of fantastic things and swallowed your incredulity and planned as if these things actually could happen. You worked all

practicable statistical possibilities, and a lot more besides. And it has to start like this."

"Everybody *knows* Japan is neutral ground, and will stay that way. There's no *point* in it!" the colonel all but wailed. "The bomb didn't even land on a city, or even a depot! Just knocked the top off a mountain in the Makabe country on Honshu. There isn't a blasted thing there."

"I'd say there isn't an unblasted thing there at the moment," chuckled his brother. "Stop telling me how you feel and let's have what you know. Was the bomb traced?"

"Of course it was traced! We have recording radar all over. It came from that ship, all right. Muscles, it was a dinky little thing, that bomb. About like a two hundred fifty pounder. But what a blossom!"

"I heard the news reports on it. Also seismographics. They had trouble picking up the Hiroshima bomb. They didn't have any with this one. It ran about seven hundred and forty-odd times as powerful."

"Officially," said the colonel, "it was well over nine-hundred at the source."

"Well, well," said Dr. Simmons, in the tone of an orchid fancier noting red spots on a new hybrid. "Disruption, hm-m-m?"

"Disruption, and how," rejoined the colonel. "Look, Muscles. We've got disruption bombs too—you know that. But just as a fission bomb blows away most of its fissionable material before it can be effective, so a disruption bomb blasts off that much more. We have bombs that make the old Baker-Day bomb look like a wet firecracker, sure; but the best we can do is about four hundred per cent. I thought that was plenty; but this thing— Anyhow, Muscles, I just don't get it. Who threw it? Why? Great day in the morning, man! An egg like that would've thrown us into a ground-loop if it had landed on any one of our centers. No power on earth would be that careless. To miss, I mean. We can't even be sure it wasn't a wild throw by one of our allies, on the other hand. Nowadays, you know everything, and you know nothing; you know it ahead of time, or you know it too late."

"My, my," said Dr. Simmons mildly. "What about the ship?"

"The ship," repeated the colonel, and his face reddened again. "I just can't believe that ship. Who built it? Where? We have everything on earth spotted that's worth spotting. Muscles, that thing was fifteen hundred feet long according to the radar."

"Anybody photograph it?"

"Apparently not. I mean, lots of radar-directed cameras shot where it was, but it didn't show, except as a blur."

"How do you know it was that big, then? You know what 'window' does to radar, for example. I

don't know just how, but that could be camouflage of some sort."

"That's what we thought at first. Until we saw the hole in the ground where it hit. That thing was *big!*"

"Saw it? I understand that the Russians cordoned off the area and threatened mass bombing if anyone came smelling around."

"A thing called a Spy-Eye," said the colonel, "with a telescopic lens—"

"Oh," said the physicist. "Well—how much of the ship was left?"

"Not much. It exploded when it hit, of course. Apparently most of it was vaporized over Michigan. The Spy-Eye pix show something being dug up, though."

"Wish I had a piece of it," said Dr. Simmons longingly. "A thorough qualitative analysis would very soon show where it came from."

"We won't get it," said the colonel positively. "Not without the Russki's co-operation anyway."

"Could that happen?"

"Certainly not! They're not stupid! They'll play this thing for all it's worth. If they can figure out where it came from, they'll know and we won't—one up for them in the war of nerves. If they can't, and the sample's worthless to them, we can't know it until we try, and we want to try. So they'll hold out for some concession or other. Whatever it is will cost us plenty."

"Leroy," said the physicist slowly, "have you heard about the so-called 'signals' in the Jansky bands?"

"I know what you're driving at," snorted the colonel. "The answer is no. But really, *no*. That's no ship from outer space. We fixed on those signals months ago, and had even the 200-incher and a whole battery of image orthicons on the indicated direction. The signal strength increased, but nothing could be seen."

"Uh-huh. And when it arrived, it couldn't be photographed."

"It— Oh. Oh-oh!"

"Well, you said yourself that if it had been built anywhere on earth you'd have known it."

"Your phone," gasped the colonel. "I've got to find out about those Jansky signals." He rushed to the corner of the room.

"They stopped," said the doctor. "Yes, Leroy. I've been following them all along. They cut out when we shelled the ship."

"Th-they did?"

"Yup."

"Well—that takes care of that, doesn't it? Even if it was something from Outside—"

"Now," said Dr. Simmons relentlessly, "with that racket off the Jansky bands, it's possible to hear the new noises."

"New—"

"Three sets of 'em. By their amplitude, I'd judge that they're scheduled to be here in two, three, and five months respectively." The colonel gasped. "*I* think," added Dr. Simmons calmly, "that they're

approaching faster than the first one."

"That can't be!" bellowed the colonel. "Haven't we enough to watch without fighting a Buck Rogers war as well? We just can't fight our own war and these invaders, too!"

"Come, come," said Dr. Simmons gently. "Why not take it up with the Board, Leroy? They're ready for everything. You told me so yourself."

The colonel glared at him. "This is no time to needle me, Muscles," he growled. "What do you think's going to happen?"

The scientist considered. "Well, what do you think would happen if you sent out—say, a plane to investigate an island? The plane circles it a couple of times, and then without warning gets shot down. What would you do?"

"Send a squadron and bomb the—" He fell silent.

"Yes, Leroy."

"But—they dropped the bomb first!"

"How do you know what they were doing? Put it on other terms; you are walking in the woods and you come to a mound of dry earth. You wonder what it is. You stick a piece of wood into it." He shrugged. "Maybe it's an ant hill. It would seem to me that an atomic bomb would be an excellent method to get a quick idea of the elemental composition of a strange planet. There's all kinds of light from the disruption, you know. Screen off what radiation you can expect from your own bomb, and what's left will give you a pretty fair spectral analysis of the target."

"But they must have known the planet was inhabited. What right had they to bomb it?"

"Did the bomb do any damage?"

The colonel was silent.

"And yet we shot the ship down. Leroy, you can't expect them to like it."

The soldier looked up suddenly, narrowly at his brother. "It was your idea to shoot it down."

"It was not!" Dr. Simmons snapped. "I was asked how it could be done, and I said how it could be done. That was all. The order was given by some eager lad in your Board, if anyone." He made an impatient gesture. "That's beside the point, Leroy. We can come out of our caves in the brave new postwar world and fix the blame to our hearts' content. Our problem at the moment is what to do when the next contingent arrives. I rather think they'll be loaded for bear. That was, you say, a big ship, and what it dropped was a small bomb. You can guess what will happen if three ships drop a few whole sticks of bombs like that—say a thousand of them."

"Three hundred would be enough to make this planet look like the moon," said the colonel whitely.

"I remember a lecture, long ago," said Dr. Simmons reminiscently, "by a man named Dr. Szilard.

Someone asked him if there was any conceivable defense against the atomic bomb. He laughed and said, 'Certainly. The Japs discovered it in eight days.'"

"A defense? Oh. They surrendered."

"That's right. That stopped the bombs from coming over."

"How do you surrender to a force you can't communicate with?"

"Perhaps we can. We can try. But from their point of view we attacked first, and in all probability they'll hit first and talk later. You would."

"Yes," admitted the colonel. "I would. The thing to do, Muscles, is to try to organize some defense."

"With the world in the state it's in now? Don't be silly! There might be a chance if everyone believed, if every nation would cooperate. But if nobody trusts anybody—"

The colonel bolted to the door. "We'll have to do what we can. So long, Muscles. I'll keep you posted— What in blazes are you grinning for?"

"Don't mind me, please," said Dr. Simmons, half laughing. "It's nothing."

"Tell me what your nothing is so I can get to work with a clear mind," said the colonel irritably.

"Well, it's just that I've been expecting the well-known atomic doom for so *very* long, that I've covered every emotion but one over it. I've been afraid, even terrified. I've been angry. I've been disgusted. And now—it's funny. It's funny because of what you're going through. Of all the things you've guessed at, trained for, planned for —it has to come like this. Sitting ducks. An enemy you can't outthink, outweigh, outsmart, or terrorize. It was always inevitable; now even a soldier can see it."

"Very funny," growled the colonel, jamming his hat down. "Out of this world."

"Hey!" called the physicist. "That was good!"

Laughing, he went to his inner laboratory. The one where no one else ever went.

Their next contact was by telephone. Too much time had passed; at least, Dr. Simmons thought it was too much time. So he called his brother. Having determined to do so, it occurred to him that he did not know exactly how to go about it; so he called the War Department in Washington. It took two minutes and forty seconds to make the contact; but the doctor heard the Washington operator, the Chicago operator, the Denver operator, the Gunnison operator, the Gunnison mobile operator, and an Operations lieutenant passing along something called a crash pri. Dr. Simmons raised his eyebrows at this, and never forgot it.

"Hi, Muscles!"

"Hello, Leroy. Listen. What's with the salvage situation? I want to do that analysis."

"The stinkers!" the colonel said

heatedly. "They made a proposition. I turned 'em down. The Board backed me up."

"What was the proposition?"

"They wouldn't send a sample. They said if we had someone who could perform a definitive analysis, to send him to Russia."

"Aha! Mountain to Mahomed, eh? Why did you refuse?"

"Don't be silly! There are maybe a half-dozen men in this country who might be able to make a really exhaustive analysis, and come up with a reliable conclusion. And about five of 'em we can't be sure."

"Send the other one, then."

"That's you, egghead. We're not going to run a risk like that."

"Why not?"

"They could use you, Muscles."

"I couldn't use anything they could give me."

"That isn't the point," the colonel assured him. "But they have ways—"

"Knock off the dramatics, Leroy. This isn't a grade B movie. And there isn't time for fooling around. We have maybe six weeks."

There was a silence. Then, "Only six weeks?"

"That's right," said the doctor positively. "Tell you what. Make arrangements to get me to Minsk right away, and let me get on that analysis. At worst we can find out what the ship was made of, and get an idea of how advanced those people are. At the very best, we might find a defense. Tell the 'proprietors' "—although this was a closed circuit, he was careful—"that my work will be open and aboveboard. They can put on as many observers as they want to, and I will share my findings completely with them."

"You can't do that! That's just what we want to avoid!"

It was the physicist's turn to fall silent. *How do you like that!* he thought. *The Board is clinging to some faint hope that the invaders will do their dirty work for them. They think that we'll find a defense and no one else will.* He said, finally, speaking slowly and carefully as if to a child, "Leroy, listen. I'm just as anxious as you are to do something about this matter. I think I can do something. But either I do it my way, or I don't do it at all. Is that quite clear? Perhaps I'm more resigned than you are. Perhaps I think we deserve this . . . are you there?"

"Yes." The doctor knew his brother had paused to lick his lips nervously. "You really think you can get something of value out of the analysis?"

"Almost certainly."

"I'll check with the Board, Muscles—"

"Yes, Leroy."

"Don't go mystic on us, hah?"

"Go see the Board," said Dr. Simmons, and hung up.

He went to Russia.

The colonel met him on his return, two weeks later at a West Coast field. The unarmed long-

range jet fighter, and its bristling escort, which had accompanied it from Eniwetok, skimmed to the landing strip. The colonel had a two-place coupé sport plane waiting. Dr. Simmons, inordinately cheerful, refused a meal and said he wanted to take off right away for his laboratories. The colonel wanted him to appear before the Board for a report, but he smiled and shook his head, and the colonel knew that smile better than to argue.

When they reached traveling altitude, and the colonel had throttled down to stay under the sonic barrier, and they had the susurrus of driving jets to accompany them rather than the roar of climbing jets to compete, they talked.

"How was it, Muscles?"

"Oh, I had a ball. It was *fine.*"

The colonel shot a look at him. *He disapproves,* thought the doctor. *War is grim and businesslike, and for anyone to enjoy the business of war seems to him a sacrilege.*

"It looked pretty touchy at first. They all acted as if I had an A-bomb in my watch pocket. Then I ran into Iggy."

"Iggy?"

"Yup. I could recite his whole name if I tried hard, but it's a jawbreaker. We used to drink forbidden sherry together in the Dorm at the University of Virginia when I was a kid in school. We thrashed out all the truths of the cosmos together. He was a swell guy. I remember once when Iggy decided that the rule forbidding women in the dorm was unreasonable. He rigged up a—"

"What happened in Minsk?" asked the colonel coldly.

"Oh. Minsk. Well, Iggy's come a long way since college. He specialized in aerodynamics, and then got tired of it. For years he'd been fooling around with nuclear physics as a hobby, and during the Second War he got real high up in the field. Naturally he was called in when this ship nosed in at Minsk."

"Why naturally?"

"Well, the fragment retained much of its shape. That's aerodynamics. And it was hot—really hot. That's nuclear physics. He was a big help. According to his extrapolations, by the way, your radar was right. If that was a part of the hull, as it probably was, and if it was a more or less continuous curve, then the ship must've been all of fifteen hundred feet long, with a four hundred-foot cross-section at max. Quite a piece of business."

"I can't say I'm happy to hear about it. Go on."

"Well, the high brass there apparently expected me to smell the fragment, taste it, and come up with a trade name. There was a lot of pressure to keep me away from testing equipment, if any. That's where Iggy came in. He apologized for my carelessness in not bringing my betatron and some distillation apparatus. They saw the point, and got me to a laboratory. They have

some nice stuff." He shook his head appreciatively.

Eagerly the colonel asked: "Anything we haven't got? Can we duplicate any of it? Where is this place? Did you see any defenses?"

"They have lots of stuff," said the doctor shortly. "Do you want me to finish? You do? All right. Well, we volatilized pieces of it, and we distilled it. We subjected it to reagents and reducers and stress analyses and crystallographic tests. We put it in magnetic fields and we tested its resistance and conductivity. We got plenty of figures on it." He laughed. Again the colonel looked impatiently at him.

"Well, what is the stuff?"

"There is no name for it, yet. Iggy wants to call it *nichevite*—in others words, 'never mind'. Leroy, it looks like dural, only it's harder and it's tougher. But it oxidizes very easily. It's metallic, but it has such a low conductivity that it makes like porcelain. It has heavy-isotope aluminum in it, and light copper, and it isn't an alloy. It's a compound. It's a blasted chemical compound, very stable, made of nothing but elements with a positive valence. It's stronger than any steel, and can withstand temperatures so high that you can forget about them. The atomic blast broke it; it didn't fuse it. We volatilized it only by powdering it and oxidizing it in an electric furnace, and then subtracting the oxygen from our calculations. That got us near enough to where we wanted to go. One thing is certain; no place on earth you ever heard about was the source of that stuff. Iggy has sworn to his bunch that the material is of extra-solar origin. They're propagandizing it in Russia now. A good thing, too. The Russians were all ready to call the whole thing a Yankee trick."

"I've heard some of those broadcasts," said the colonel. "I was hoping we could keep that information to ourselves."

"Don't be childish," said the physicist, in as abrupt a tone as he ever used. "We're not out on maneuvers, sonny. Time and time again one person or another has told the world to wake up to reality. This once the world will wake up or else. You won't be able to keep it asleep any more. It's gone too far."

The threat from Outside finally broke in the papers, but only after long and worried conferences in governmental and military headquarters all over the world. The simple fact that the world would work together or face extinction made, at first, as much impression as it ever had—very little. It was not enough to overcome man's distrust of himself. Not at first.

But the die-hards yielded, gradually and with misgivings, and acquainted the people with the menace that faced them. There was little dangerous panic—controls were too tight to allow for it—but, after the first thrill of excite-

ment, there came a unanimous demand for a plan of action which was too powerful to ignore.

Bulletins were posted hourly on the amplitude of the Jansky signals. As Dr. Simmons had pointed out, there were three sets of them, and it became increasingly evident that the three sources were in V formation, and coming fast—much faster than the first one had.

"They'll box us," said Colonel Simmons. "There won't be any circling this time. They'll take up equidistant positions around the planet, out of our range, and they'll fire at will."

"I think you're right," said his brother. "Well, that gives us two kinds of defense. They're both puny, but it'll be the best we can do. One's technological, of course. I don't know exactly which direction would be the best to take. We can build ships ourselves, and attack them in Space. We can try to develop some kind of shield against their bombs, or whatever else they use against us. And we can work on seeking torpedoes of some sort that'll go out and get 'em—bearing in mind that we might be out there ourselves sometime soon, and we don't want to fall prey to our own weapons."

"What's the other defense?"

"Sociological. In the first place, we must decentralize to a degree heretofore impossible. In the second place, we must pool our brains and our physical resources. No nation can afford to foot the bill of this kind of production; no nation can afford to take the chance of bypassing some foreign brain which might help the whole earth. Leroy! Stop puckering up like that! You look as if you're going to cry! I know what's bothering you. This looks like the end of professional militarism. Well, it is, in the national sense. But you have a bigger enemy than ever before, and one more worthy of the best efforts of humanity. You and your Board have been doing what seemed to be really large thinking. It wasn't, because its field was too small and too detailed. But now you have something worth fighting. Now your plans can be planetary—galactic—cosmic, if you like. Don't hanker after the past, soldier-boy. That attitude's about the only way there is to stay small."

"That's quite a speech," said the colonel. "I . . . wish I could argue with it. If I admit you're right, I can only admit that there is no solution at all. I don't believe the world will ever realize the necessity for co-operation until it's too late."

"Maybe it will. Maybe. I remember once talking to an old soldier who had been in the First War. In his toolshed he had a little trench shovel about eighteen inches long—a very flimsy piece of equipment it was. I remarked on it, and asked him what earthly good it was to a soldier. He laughed and said that when a green squad was deployed near no man's land and

ordered to dig in, they gabbled and griped and scratched and stewed over the job. And when the first enemy bullets came whining over, they took their little shovels and they just *melted* into the ground." He chuckled. "Maybe it'll be like that. Who knows? Anyway, do what you can, Leroy."

"You have the strangest sense of humor," growled the colonel, and left.

They came.

The first was just a shape against the stars. It could be heard like a monster's breath in a dark place: *wsh-h-h-t wsh-h-h-t wsh-h-ht* on the sixty megacycle band, where, before, nothing had been heard but the meaningless hiss of the Jansky noise. But it could not be seen. Not really. It was just a—a shape. A blur. It did not reflect radar impulses very well; the response was indeterminate, but indicated that it was about the size and shape of the mysterious bomber which had dealt the first, terrifying, harmless blow.

The world went crazy, but it was a directive madness. With the appearance of the Outsider, all talk of the advisability of defense ceased. There could be no discussion of priorities.

A Curie Institute scientist announced light-metal fission. A Hungarian broke his own security regulations with the announcement of an artificial element of heretofore unthinkable density, which could be cast into fission-chambers, making possible the long-awaited pint-sized atomic engine. A Russian scientist got what seemed to be a toe hold on antigravity, and set up a yell which resulted in a conclave of big brains in Denver—men from all over the world. He was wrong, but a valuable precedent was set. A World Trade Organization was established, with control of raw materials and manufactured goods, their routes and schedules. Its control was so complete that tariffs were suspended *in toto*—the regulation read "for the duration"—and, since it is efficient to give a square deal, a square deal was given in such a clear-cut fashion that objectors were profiteers by definition. Russian ores began appearing in British smelters, and Saar coal was loaded into the Bessemers of Birmingham. Most important of all, a true International Police force came into being with hardly a labor-pain. Its members were free to go everywhere, and their duty was to stop anything which got in the way of planetary production. Individual injustice, faulty diet, poor housing, underpaying and such items fell immediately into this category, and were dealt with immediately and with great authority.

Propaganda unified itself and came to a focus in the hourly bulletins concerning the Outsiders. And every radio station on earth in-

cluded that dread triple hiss in its station-breaks.

And the Outsider just stayed where it was, just lay there in the spangled black, breathing, waiting for its two cohorts.

"It's makeshift," said Dr. Simmons, "but it might do. It just might do."

The colonel stepped past him and looked at the cradle, on which rested a tubby, forty-foot object like a miniature submarine.

"A satellite, you said?"

"Uh-huh. Loaded to the gills with direction-finders and small atomic rockets. It'll keep a continuous fix on the Invaders during its transit, and relay the information to monitor stations on Earth. If one of the ships fires a torpedo, it will be detected immediately, reported, and the satellite will launch an interceptor rocket. If the bomb or torpedo dodges, the interceptor will follow it. In the meantime, big interceptors can be on their way from Earth. If a torpedo comes close to the satellite, the satellite wil'

dodge. If it comes too close, the satellite will explode violently enough to take the torp with it. We plan to set out three layers of these things, nine in each stratum, twenty-seven in all, so spaced as to keep a constant scanning in every direction."

"Satellites, hm-m-m? Muscles, if we can do this, why can't we go right out there and get the ships themselves?"

The physicist ticked the reasons off on his fingers. "First, because if they bracket us, as in every likelihood they will, they'd be foolish to come any closer than the one that's already here, and he's out of any range which we can certainly handle just now. We can assume that his ships, if not his bombs, will be prepared against our proximity devices. We'll try, of course, but I wouldn't be too hopeful. Second, we still haven't a fuel efficient enough to allow for escape velocity maneuvers without a deadly acceleration, so our chances of sending manned rockets up for combat are nil at the moment."

The colonel looked admiringly at the satellite and the crowd of technicians which swarmed around it. "I knew we'd come up with something."

His brother gave him a quizzical glance. "I don't know if you fully realize just how big a 'we' that is you just used. The casing of that satellite is Swedish steel. The drive is a German scientist's adaptation of the Hungarian baby fission engine. The radio circuits are American, except for the scanning relay, which is Russian. And those technicians—I've never seen such a bunch. Davis, Li San, Abdallah, Schechter, O'Shaugnessy—he comes from Bolivia, by the way, and speaks only Spanish—Yokamatsu, Willet, Van Cleve. All these men, all these designs and materials, and all the money that make up these satellites, have been found and assembled from all over the earth in only the last few weeks. There were miracles of production during the Second War, Leroy, but nothing to match this."

The colonel shook his head dazedly. "I never thought I'd see it happen."

"You'll see more surprising things than this before we're done," said the scientist happily. "Now I've got to get back to work."

That was the week the second Outsider arrived. It took up a position in the celestial South, not quite opposing its fellow, and it lay quiet, breathing. If there was converse between them, it was not detectable by any known receiver. It was the same apparent size, and had the same puzzling effect on radar and photographic plates as had its predecessors.

In Pakistan, an unfueled airplane took off from a back-country airstrip, flew to twenty-thousand feet, and came in for a landing. The projector which was trained on it had no effect on the approaching

aircraft in the moment it took the plane to disappear behind a hillock and reappear on the other side. There was a consequent monetary power loss, and the plane lost too much altitude and had to make another pass. The wind direction dictated a climbing turn to the north, and the beam from the projector briefly touched the antenna of an amateur radio operator called Ben Ali Ra. Ben Ali Ra's rig exploded with great enthusiasm, filling the inside of his shack with spots and specks of fused metal, ceramic, and glass. Fortunately for him—and for the world he was in the adjoining room at the time, and suffered only a deep burn in the thigh, where it was struck by a flying fragment of a coil-form.

This was the first practical emergence of broadcast power.

Ben Ali was aware of the nature of the experiments at the nearby field, having eavesdropped by radio on some field conversations. He was also aware of certain aims and attitudes held by the local authority. Defying these, he left the area, at night, on foot, knowing that he would be killed if captured, knowing that in any event his personal property would be confiscated, and in great pain because of his wound. His story is told elsewhere; however, he reached Benares and retained consciousness long enough to warn the International Police.

The issue was not that broadcast power was a menace; it had a long way to go before it could be used without shouting its presence through every loud-speaker within miles. The thing that brought the I.P. down in force on this isolated, all but autonomous speck on the map was the charge that the inventors intended to keep their development to themselves. The attachment of the device and all related papers by the Planetary Defense Organization was a milestone of legal precedent, and brought a new definition of "eminent domain." Thereafter no delays were caused by the necessity of application to local governments for the release of defense information; the I.P. investigated, confiscated, and turned the devices in question over to the Planetary Defense Organization, acting directly, and paying fairly all parties involved. So another important step was taken toward the erasure of national lines.

Two weeks before the arrival of the third Outsider—the third of the V, excluding the one which had been shot down—the last of the twenty-seven satellites took up its orbit, and the Earth enjoyed its first easy breath since the beginning of the Attack—for so it was called.

Due to high-efficiency circuits and components, the fuel consumption of the electronic setup in the satellites was very small. They held their orbits without power, except for an occasional automatic correction-kick. They could operate without servicing for years. It was assumed that by the time they

needed servicing, astrogation would have developed to the point where they could be refueled—and recharged—by man-carrying ships. If technology did not solve that problem, little harm could be done by the silent, circling machines; when, at long last, they slipped from their arbitrary orbits and spiraled in to crash, so many years would have passed that the question was, momently, academic.

And even before the twenty-seventh satellite was launched, factories were retooling for a long dreamt-of project—a Space Station, which would circle the Earth in an orbit close enough to be reached by man-carrying rockets, which would rest and refuel there and take off again for deep Space, without the crushing drag of Earth's gravity.

The third Outsider took up its position, as Dr. Simmons had prophesied, equidistant from the others with the Earth in the center, rolling nakedly under them. As in the case of the arrivals of the other two, there was no sign of its presence but the increasing sound on the sixty megacycle band. Radar failed utterly to locate it until, suddenly, it was in its position—a third blur against the distant stars, a third indeterminate, fifteen-hundred-foot shape on the radarscopes.

The Board of Strategy was happily, almost gleefully, busy again. Their earlier work within the field of the probability of human works, faded to insignificance against the probabilities inherent in the Attack. There was another major difference, too; they came out in the open. They plastered the world with warnings, cautions, and notices, many of them with no more backing than the vivid imagings of some early science-fiction writer—plus probability. Although logic indicated that the first blows would be in the form of self-guided missiles, thousands of other possibilities were considered. Spy rays, for example; radio hams the world over were asked to keep winding coils, keep searching the spectrum for any unusual frequencies. Telepathic amplifiers, for another example; asylums were circularized for any radical changes in the quality and quantity of insanity and even abnormal conduct. The literary critics were called in to watch for any trends in creative writing which seemed to have any inhuman content. Music was watched the same way, as were the graphic arts. Farmers and fire wardens were urgently counseled to watch for any plant life, particularly predatory or prehensile or drug-bearing plant life, which may develop. Sociologists were dragged from their almost drunken surveys of this remarkable turn of social evolution, and were ordered right back into it again, trying to extrapolate something harmful to come from this functional, logical, unified planet. Only the nationalists found harm, and they were—well, unfashionable.

The bombs came about a month after the third Outsider took up his post.

The whole world watched. Everything stopped. Every television screen pictured radarscopes, and the whip-voiced announcer at Planetary Defense Central in Geneva, which had at long last regained its place at a world center.

The images showed Outsiders A, B, and C in rapid succession. So well synchronized was the action that the three images could have been superimposed, and would have seemed like one picture. Each ship launched two bombs; of each two, one turned lazily toward Earth, and the other hovered.

"Out of range of the satellites," said the announcer. "We shall have to wait. The satellites will detect the bombs when they are within two hundred miles, and will then launch their interceptors. Our Earth-based rockets are aiming now."

There was a forty-minute wait. Neighbor called neighbor; illuminated news-banners on the sides of buildings gave the dreaded news. Buses and trains stopped while their passengers and crews flocked to televisors. There was a hushed tension, world-wide.

"*Flash!* Satellite 24 has released an interceptor. Stand by; perhaps we can get a recording of the scanner . . . one moment please . . . *Anything from Monitor 24b yet, Jim? On the air now? Check . . .* Ladies and gentlemen, if you can be patient a moment; we are recording pictures of the radarscope at Monitor 24b in Lhasa. It will be only a few . . . here it is now."

Flickering at first, then clearing, came the Lhasa picture. The monitor station there kept a fix on Satellite 24 from horizon to horizon, as did the satellite's other two stations in San Francisco and Madrid. The picture showed the familiar lines of the satellite. Abruptly a short, thick tube began to protrude from the hull. When extended about eight feet, it swung over about forty degrees on its ball-and-socket base. From its tip shot a small cylinder; there was a brief flicker of jets. "The interceptor," said the loudspeakers unnecessarily.

The scene flashed to the Earth-based interceptor station at White Sands. A huge rocket mounted with deceptive slowness, balanced on a towering column of flame, and disappeared into the sky.

Then, bewilderingly, the scene was repeated for Monitor Stations 22c and 25a, as their satellites sensed the bombs coming from Outsiders B and C. White Sands sent two more giant rockets up as fast as they could set the seeking gear.

Then, after an interminable four hours, came the picture which was to stand, forever, as the high-point in newsreel coverage. It was the image picked up from the relaying television camera in the nose of Satellite 24's little interceptor.

It fixed the image of the Outsider's bomb, and it would not let

go. The bomb, at first only a speck, increased in size alarmingly. It was a perfect cylinder, seen in perspective. There was nothing streamlined about it. It was quite featureless except for a strange indistinction around one end, as if it were not in focus. It was like a small patch of the substance of the Outsiders themselves.

The image grew. It filled the screen—

And then there was nothing.

But cameras all over Europe picked up and relayed the image of that awe-inspiring explosion. Silently a ball of light appeared in the sky, expanding, flickering through the entire spectrum, sending out a wheel of blue and silver rays. It lasted for a full fifteen seconds, growing in size and in brilliance, before it began to fade, and it left a pastel ghost of itself for a minute afterward. Speckles of random radiation cluttered the screens then, and there were no more actual pictures of the action.

The entire earth gave a concerted shout of joy. In dozens of languages and dialects, the fierce, triumphant sound roared skyward. *Got one!* And the bells and the whistles picked up the cry, frightening sleeping birds, sending crocodiles scuttling off river banks, waking children over the world. It was like a thousand New Year's Eves, simultaneously.

What happened next, happened quickly.

A White Sands rocket got the second bomb. For some reason there was no atomic explosion. Perhaps the proximity gear failed. Perhaps it was neutralized, though that would seem impossible, since the seeking gear obviously did not fail. It was not as spectacular as the first interception, but it was quite as effective. The purely physical impact as the huge interceptor struck the tiny bomb all but pulverized them both.

The third bomb breezed past its satellite interceptor, its White Sands interceptor, and a second-stratum satellite. It was observed that on getting within range of the seeking-radar of each of these, it became enveloped in the misty, coruscating field which characterized the Outsider ships. Apparently this field completely confused the radar; it was as if the radar detected it but didn't know what to do with it—"same spot we were in a year ago," as Dr. Simmons remarked tersely.

The bomb entered the atmosphere—

And burned up like a meteor.

Then it was that the most incredible thing of all happened.

The three hovering bombs—one by each Outsider—slowly retreated toward the parent vessels, as if being reeled in.

They recalled their bombs.

Thereafter they lay quietly, the three Outsiders. They did not move, they made no move. They gasped their triple pantings, and

they filled thousands of photographic plates with their indeterminate muzziness, and that was all.

Four giant rockets out of five, which were sent after the invaders, missed their mark completely. The fifth, which was equipped with an ingenious seeking device based on correlation of its target with an actual photographic transparency of the target, apparently struck Outsider B. There was a splendid atomic display, and again the world went mad with joy.

But when the area could be observed again, Outsider B was still there. And there it stayed. There they all stayed.

A cyclic, stiffly controlled panic afflicted the Earth, as a sense of impending doom was covered by humanity's classic inability to fix its attention for very long to any one thing; alternated to reactive terror, swung away from terror again because life must go on, because you must eat and he must love and they must make a bet on the World Series. . . .

Seven months passed.

Dr. Simmons plodded into his private office and shut the door. He was tired—much more tired than in the days, earlier that year, when he was working an eighteen-hour day. *The more a man does, the more he can do,* he reflected wearily, *until the optimum is reached; and the optimum is way up yonder, if he cares about what he's doing.* He sat down at his desk and leaned back. *And if he cares just as much as ever, but there just isn't as much to do, he gets tired. He gets very, very tired . . .*

He palmed his face, blinked his eyes, sighed and, leaning forward, flipped the annunciator switch. His night secretary said brightly: "Yes, doctor?"

"Don't let anything or anybody in here for two hours. And take care of that cold."

"Yes, sir. Thank you, doctor; I will."

A good kid. . . . He rose and went to the washroom which adjoined his office. Stepping into the shower stall, he lifted up the soap dish, which had a concealed hinge, and pressed a stud under it. He counted off four seconds, released the stud, and pulled on the hot water faucet. The back wall of the shower swung toward him. He stepped through into his own private laboratory—the one where no one else ever went.

He kicked the door closed behind him and looked around. *I almost wish I could do it all over again. The things that have happened here, the dreams . . .*

His thought cut out in a sudden, numbing shock.

"What are you doing here?"

The intruder accepted the question, turned it over, altered it and gave it back. "What have *you* been doing here?" rasped the colonel.

The physicist sank into an easy-chair and gaped at his brother. His pulse was pounding, and for a mo-

ment his cheek twitched. "Just give me a second," he said wryly. "This is a little like finding someone in your bed." He took out a handkerchief and touched his dry lips with it. "How did you get in here?"

Leroy Simmons was sitting behind a worktable. He had his hat, with its polished visor, in the crook of his arm, and his buttons were brilliant. He looked as if he were sitting for a particular kind of portrait. The doctor jumped up. "You've *got* to have a drink!" he said emphatically.

The colonel put his hat on the table and leaned forward. The act wrinkled his tunic and showed up his bald spot. "What's the matter with you, Muscles?"

The doctor shook his head. *He doesn't look like a man of distinction any more,* he thought regretfully. "I feel a little better now," he said. "What brings you here, Leroy?"

"I've been watching you for months," said the colonel. "I've had to do it all myself. This is . . . it's too big." He looked completely miserable. "I followed you and watched you and checked up on you. I took measurements all around these offices, and located this room. I was in here a dozen times, looking for the gimmick on the door."

"Oh, yes. Always dropping around to see me when I wasn't around, and saying you'd wait. My secretary told me."

"Her!" The syllable was eloquent. "She's no help. I never saw anyone harder to get information from."

"It's an unbeatable combination in a secretary," he grinned. "Infinite tact, and no facts. She's not in it, Leroy. No one is."

"No one but you. I notice you're not denying anything."

The doctor sighed. "You haven't charged me with anything yet. Suppose you tell me what you know, or what you think you know."

The colonel took a somber-backed little notebook out of his pocket. "I have no associates," he said grimly, "either. It's all in here. Some of it is Greek to me, but some I understand—worse luck. I wish I didn't. You have something to do with the Outsider, don't you?"

His brother looked at him for a long moment, and then nodded, as if he had asked and answered a question.

"Yes."

"You know where they come from, what they're going to do, how they operate—everything about them?"

"That's right."

"They have given you—information. They have given you a way to"—he referred to the book, his lips moving as he read; they always had—"expand and concentrate binding energy into a self-sustaining field."

"No."

"No? You have all the formulas. You wrote thousands of

pages of notes on the subject. Your diary mentions it repeatedly—and as if it was an accomplished fact."

"It is. I didn't get it from the Outsiders. They got it from me."

There was a jolting silence. The colonel turned quite white. "That . . . does . . . it," he whispered. "I knew you were in contact with the enemy, Muscles. I tried my best to believe that you were simply working them for information, so that we could use it against them. A risky game, and you were playing it alone. After I went through your papers here, I just couldn't believe it any more. You seemed to be working along with them. And now you tell me that you actually are supplying them with devices we haven't got!"

The scientist nodded gravely.

The colonel's hand, under the table, moved to his wrist. He touched a button on the small transmitter there, and pulled a slide over.

Dr. Simmons said, thickly: "Leroy. Would you mind telling me how you got on to this?"

"I'll tell you, all right. It started with a routine checkup of supplies and equipment into these laboratories, for auditing purposes. No production is run without cost accounting, even by the government. Even by a Planetary one. It was brought to my attention that certain things came in here that apparently never went out. When I went over the reports and saw they were correct, I wrote a memo which cleared you completely, on my authority, and I killed the investigation. I—picked it up myself."

"Good heavens, why?"

"If I found anything," the colonel said with difficulty, "I wanted to take care of it myself."

"Sort of keep the family name sweet and clean?"

"Not that. You're too clever. You always were. I . . . I'll tell you something. I was appointed to the Board because of you. I never could have made it otherwise. The Board figured I'd be an intimate link with you; that I could see you any time, when no one else could."

Of course I knew that, thought the doctor. "I didn't know that," he said. "I don't believe you."

"Oh, cut it out," said the colonel. "You played me for a sucker all along, and through me, the Board."

Correct again, the physicist thought. He said: "Nonsense, Leroy. I just withheld information from time to time."

"You gave us tips," said the colonel bitterly. "You sent us off on goose chase after goose chase. And we pushed the whole world around the way you wanted us to."

The boy's real sharp tonight, thought Dr. Simmons, and added to himself, *He's such a swell, sincere character. I hate to see him go through all this.* "And why does all this make you squelch the Board's investigation and pick it up yourself?"

"I know how slick you are," said the colonel doggedly. "You just might talk a jury or a court-martial out of shooting you. I don't see how you could, but I don't see how you could have done any of this either." He waved a hand around the secret lab. "You won't talk your way out of it with me."

"You're my judge, then, my jury. My executioner, too?"

"I'm . . . your brother," said the colonel in a low voice, "and, like always, I want you to get what you deserve."

"I could puddle up and bawl like a baby," said Dr. Simmons suddenly, warmly. "Let's stop playing around, Leroy, and I'll tell you the whole story."

"Is it true you've been working with the Outsider?"

"Yes, you idiot!"

The colonel slumped back and

said, glumly: "Then that settles it. Go ahead and talk if you want to. It can't make any difference now." He looked at his watch.

The scientist rose and went to a wall panel, which he pulled out, revealing a compact tape recording outfit. From a rack above it he selected a reel, set it on the peg, and drew the end of the tape into the self-threader. Without switching on, he returned to his chair.

"Just a couple of preliminaries, Leroy, and then you can have the whole story. I have done what I have done because of what you used to call my 'dewy-eyed idealism.' It has worked. We live now in a unified world. It must remain unified until the threat of the Outsider is done with; it has no alternative. I don't think that the Outsider will be removed for a while yet, and the longer the world lives this way, the harder it will be for it to go back to the old cut-up, mixed-up way of life it has followed for the last fifteen thousand years or so.

"I'll tell you what will happen from now on out. The Space Station will be completed and put into action. A new fuel will be developed which will speed things just at the boredom point. Shortly afterward, the three Outsiders will put out their hovering bombs again. It'll throw the world into a panic, but with the Station and the new fuel and the whole world working at it, a fighting ship will leave the Station—outbound.

"It will sling some torps at the Outsiders, and they won't go off, or they'll miss, or they'll explode prematurely. The Outsider won't hit back. The warship will move in close, and when it gets close enough to do real damage, it will get a message.

"This message will be broadcast on the three most likely frequencies, and signals will go out all over the other bands advertising those three frequencies. The message will start like this: 'Stop and listen. This is the Outsider.' This will be repeated in English, French, Spanish, German, Arabic and, for good measure, Esperanto. This is the message."

He rose again, put his hand on the switch, smiled, and turned to face the colonel. "Funny . . . this was designed only to speak to the future. And you're the first to hear it."

"Why is that funny?"

"You're the past." He flipped the switch. "You'll pardon the tone of it," he said gently. "I had a chance to make a deep purple oration, and I find I ramble on like an old lady over her knitting."

"You?"

"Me. The Outsider. Listen."

This is the message, as it came from the tape in Dr. Simmons' leisurely mellow voice.

I am the Outsider. Do not fear me. There will be no battle. I am your friend. Hear me out.

I am four ships and a noise in the Jansky radiations. The ships are not ships, and they came from

Earth, not from Outside. The Jansky signals do not come from the stars. Listen.

I am one man, one man only, without helpers, without any collaborators, except possibly thinkers —a little Thoreau, a little Henry George, maybe a smattering of H. G. Wells . . . you can believe me. Archimedes once said, "Give me a lever long enough, and a place for a fulcrum, and I shall move the earth!" Given the tools, one man can do *anything*. There's plenty of precedent for this. Aside from the things which produce a man, aside from the multitude of factors which make his environment, if the man is capable, and if the environment provides tools and a time ripe for action, that man can use his tools to their utmost extent. Hitler did it. John D. Rockefeller and Jay Gould did it. Kathleen Winsor did it. I read somewhere, long ago, a beautiful allegory. "Take a naked human being, and set him down beside the Empire State building, and ask, what have these two things in common?" Given the tools, mankind can do *anything*.

I was given the greatest single tool in history. I stumbled on it. I'll tell you the truth: I worked like a hound dog to find it, once I suspected that it was there.

It's a theory and a device. The theory has to do with binding energy; the device releases and controls it. It is all completely and clearly explained elsewhere; I'll come to that in time. Roughly speaking, however, it is a controlled diffusion of matter. Any gas can be rarefied and diffused. So, I have discovered, can any matter. Further, it can be diffused analytically. Binding energy is actually a component of matter. If a close-orbit situation can be induced between the electrons and the nucleus of an atom, its binding energy can be withdrawn, if equally diffused, to form a field around the atom. The field is toroidal, and has peculiar qualities.

For one thing, it does crazy things to the apparent center of gravity of the mechanism producing the field. Any seeking device which tends to locate mass, directs itself at the c.g. But on approaching a field of this sort, the closer it gets, the harder it becomes for it to find the c.g., since the apparent center of mass is out at the edges. When directed at the actual center of the device, your seeker veers violently to the edge—hard enough, generally, to make it pass the mechanism altogether.

The field distorts and reflects radio and light waves in an extremely complex fashion. These waves are led powerfully to follow the outlines of the toroid; but since the field is a closed one—closed as tightly as only binding energy can close anything—light and radio cannot penetrate, no matter how strong the temptation. And so they are thrown back, rather than reflected in reflection's ordinary sense, and return to their detectors—re-

ceivers, photographic plates, or what have you—in a rather distorted pattern.

The field has also a strange effect on valence, making it possible to build chemical compounds out of elements of similar valence. The atomic situation within the toroid—in the hole of the doughnut, as it were—is weird, and is the place where such compounding can be done. Exact data on this will also be given you.

Now, here is exactly what was done. Having found the way to generate this field, I debated the wisdom of giving it to a world on the verge of war. I contemplated destroying all my evidence, but could not; the thing was too big; humanity needed it too much. But it was too big for even a unified humanity on one planet. It's big enough for all of space, and needs a humanity big enough to control it. I felt that if humanity were big enough to unify, it would be big enough for this device. It is, now, or you spacemen would not be listening to me.

After having developed the binding-energy field, I invented another device—the Spy-Eye. I knew that the little eavesdroppers would be produced by the thousands, so that a few would not be missed. A half-dozen were launched with their selector circuits altered, and some of their equipment replaced. Their fueling was different, too; there is a reaction-formula using the b.e. field which will be found with the rest of these things.

My half-dozen Spy-Eyes, powered vastly beyond any of their little brothers and sisters, went Outside and took up their positions in space.

They are the Outsiders!

The noise in the Jansky radiation was pure propaganda, and its execution was simple—practically primitive. It was a trick once used by illegal radio stations during one of the Wars—I forget which. Three of them, widely separated and synchronized, sent out the same signal, beamed to an Earth diameter. Direction-finders on Earth obediently pointed out their *resultant*—a direction in which they did not exist! The Spy-Eyes themselves were too small and too far away to be detectable, unless one knew exactly what to look for and where to look. The amplitude of the signals was raised gradually until it reached a pre-selected volume. Then one of the Spy-Eyes set up a b.e. field and dropped toward Earth. It looked strange and huge. It came in close and circled Earth twice at a high velocity. I think I had more trouble there than at any other point; but I managed, finally, to wangle the Board of Strategy into firing on it. Their shell hit nothing; the b.e. field disrupted its atomic warhead, for in the presence of a hard-radiation source, the field increases the effective critical mass. The Spy-Eye itself is what fell on Japan; it was armed, of course,

and was mistaken for a little bomb. What made the explosion so intense was the fact that the field held the disrupting matter together for a fraction of a millisecond longer than it had ever been done before. The object which fell near Minsk was a piece of stage-proppery I had made earlier. It, too, had a b.e. field generator on its back. Again it exhibited its exclusiveness and its penetrating power; it acted like a thing of great mass when it hit the ground. The generator was, of course, blown to dust on impact, leaving only the supposed specimen.

The other three Outsider ships were Spy-Eyes, b.e. field equipped. The bombs were real bombs, however. They were supplied by Satellite 18, which, if examined, will be found inexplicably empty of its interceptors. I put guiding heads on them, and sent one to each of my "Outsider" Spy-Eyes.

I think that explains everything. If you question my motives, regard the Earth as you deep-spacemen see it today—unified, powerful, secure within and without. Humanity is ready, now, to take the first steps toward greatness. Therefore:

Send my name—Simmons—in the old International Morse code on 28.275 meters, from a distance of ten statute miles from any of the three Invader ships, at one thousand watts power. Repeat the name four times. The field will break down; you may then locate the Spy-Eyes and pull them in. Dismantle them; inside you will find this recording and certain papers, which contain everything I know about the binding-energy field. Use it well.

Colonel Simmons leaned back in his chair. His face was gray. "Muscles—is this all true?"

"You know it is. You've seen it in action."

"Now what have I done?" muttered the colonel.

"Jumped to conclusions," said the doctor easily.

The colonel's mouth opened and closed spasmodically. Then in violent reaction, he swore. "You couldn't've done it!" he roared. "You set the timetable for this whole thing and built it into those Spy-Eyes. Well, what about all that was done here—the interceptors from White Sands, and the development of the satellites, and all that?"

"Leroy, old horse, take it easy, will you? Who had charge of all that development? Who had the final say on design? Who outlined the exact use of each piece of equipment—by way of course, of using it to its greatest efficiency?"

"You did. You did." The colonel covered his face. "All that power. All that control. You could have had the whole world for the taking, if you'd wanted it. Instead—"

"Instead, everyone on earth has a job, enough food, good quarters, and an equal chance at education.

I have it on good authority that the next session of Congress will unify divorce laws and traffic laws in this country. Russia has not only a second party, but a third one. Social legislation is beginning to follow the lines of the Postal Union, and already a movement has started to have the Governments pay the people their full wages during a six-week vacation. No Communism, no Fascism; function is the law, and social security—lower case—is function."

"Shut up!" mouthed the colonel in a peculiar tone, half moan, half roar. He held his head and he rocked.

The doctor clasped his shoulder and laughed. "Listen to me, Leroy," he said, "and I'll tell you something funny. You know how little, stupid anecdotes will stick with you, like the limerick about the young lady from Wheeling, and the time you took the ball of tar to bed with you and we had to shave your head? Well, believe it or not, I honestly think that this job I have just done had its source in a couple—no; three—things that happened to me when I was young. When I think of them, and look at the world today—my!"

He took a turn around the floor. His brother sat still.

"Wells had something to do with it. Wells pointed out, mostly indirectly, that only a miracle could make humans work together. And sometimes his miracle was entertaining but untenable, because it constituted a common aim for mankind. That never did work. World peace is the finest aim a race could have, but it never tempted us much. Wells' other miracle was a common enemy—the Martian invasion, for example. Now, that makes sense. It did then and it does now.

"And here are the silly little things that have stuck with me. Remember that summer when I got a job as a dirt-moving foreman on a canal job? Two of the muckers got into a fight out by one of the machines. I got up into the dragline and dumped a load of sand on the two of them. They stopped fighting, ganged up on me, and punched the daylights out of me." He laughed.

"Then there was the other one. It was even sillier. It was in a restaurant, right after I started to teach at Drexel Tech. There were two bubble-headed little chicks sitting at a nearby table, verbally clawing each other's eyes out over a young man. Just as I was about to get up and move back out of the combat area, they spotted the young man in question submitting to the wiles of a very cute redhead. Whereupon the combatants were suddenly allies, and on the spot"—he laughed again—"concocted a devilish scheme to squirt ink on the contents of the redhead's clothesline!"

The colonel was looking at him dully.

"The common denominator," continued the doctor, "in the analysis of Wells, the fight on the canal job, and the feline fiddle-faddle in the café, was surprisingly valid, considering the wide difference in the nature of the fields of combat. It boils down to this: that human conflicts cease to be of importance in the face of a common enemy. 'Divide and rule' has its obverse; 'unite and conquer.' That's what the world has done during the Attack; except that instead of conquering the Outsider, it has conquered itself—still its common enemy."

"Wells," murmured the colonel. "I remember that. I was reading him and told you the miracle idea. I was in military prep., and you were a freshman in college."

"Gosh yes," said the doctor. "I remember, Leroy."

The colonel seemed to be thinking hard, and slowly. He spoke slowly. "Muscles," he said, "remember how I wore your freshman dinky when you came home for a week end?"

"Do I!" chuckled the doctor. "You wouldn't give it back, and I spent the next six weeks sweeping out seniors' rooms because I showed up at school without it. Heh! Remember me strutting around in your gray cape when you were at the Point?"

"Yeh. We were always doing that. Your tie, my tie, our tie. Those were the days. You wouldn't fit my clothes now, Fatso."

"Is *that* so!" laughed the doctor, delighted to see his brother making some effort to come up out of his doldrum. "Listen, son; you rate too much to be in shape. Too many flunkies to bend over for you when you want your shoes tied."

The colonel whipped off the coat with all those shiny buttons. "You couldn't button that around your fallen chest."

In answer the grinning doctor shucked out of his laboratory smock and put his arms into the uniform jacket. With some difficulty and a certain amount of sucking in and holding back, he got it buttoned. "The hat," he demanded. He put it on. It was too small.

Meanwhile the colonel slipped into the smock, with its solder-flux stains and its worn elbows. He flapped it in front of him. "What do you do with all this yardage? Smuggle stuff? Hey, Muscles; let's have a look in the cheval glass in the office. I want to see what I would look like as a Great Brain."

They went into the office, through the door in the shower stall. The doctor, all aglitter in his brother's jacket, went first. There was a man standing just by the outside door. He had a black cloth over his nose and mouth and a silenced automatic in his hand.

The colonel, his smock flapping, pushed past his brother and walked

out into the room. The man shot him twice and disappeared through the door.

"Leroy! Who did it, kid?"

"I did," said the colonel. *"No!* No doctor. Too late. Stay—"

"You . . . oh. *Oh!* That bullet was meant for me. The jacket switch, hm-m-m? But why? Who was it?"

"Never mind . . . him," said the colonel. "Hired. Psychoed. Whole thing planned. Foolproof escape. All witnesses called away. He doesn't know you. Or me. My idea. Was very . . . careful."

"Why? Why?"

"Found out you . . . work with . . . enemy—" His voice trailed off. He closed his eyes sleepily and lay still for a moment. Then, his face twisted with effort, he sat suddenly upright. His voice returned—his normal, heavy, crackling tone. "I had proof—proof enough that you were a traitor, Muscles. I was afraid you'd get clear if you got a chance to work on a court. But I couldn't bring myself to kill you with my own hands. I figured it out this way."

"So he'd be there, and shoot me when we came out of the office. But why didn't you call him off?"

"Couldn't. He had orders to shoot the civilian. You were an officer for the moment. He didn't know us, I tell you. I radioed to a third party, who knows nothing. He gave this hood the starting gun." He raised his left hand. On the wrist was the miniature transmitter. "I called him when you admitted you worked with the Outsider . . . then you explained . . . and I couldn't call back; he was on his way here."

"Leroy, you fool. Why didn't you let him go ahead? Why did you make that silly switch? My work's done. Nothing can change it now!"

"Muscles . . . I'm . . . old-line Army. Can't help it . . . don't like this . . . brave new . . . never could. You're fit for it. You made it; you live in it. Besides, you'll . . . appreciate the joke better than . . . I would."

"What do you mean, kid?"

"You underestimated . . . you thought you'd be dead when the . . . spacemen heard your recording." He laughed weakly. "You won't be, you know. Things're moving too fast."

There was a sudden, horrible spell of coughing.

And then Dr. Simmons was alone, holding his dead brother's head in his arms, rocking back and forth, buffeted and drowning in an acid flood of grief.

And behind it—far, far behind it, his articulate mind said, dazedly:

Great day in the morning, he's right! What'll they make of me —a saint, or a blood-red Satan?

THE END.

SCHOOL FOR THE STARS

BY JOHN D. MacDONALD

The idea was to train colonists for the things they might face on those alien worlds. But the little training gadget that was turned on him wasn't by any means on the curriculum!

Illustrated by Orban

Central Assignment consisted of one hundred and three blond stone buildings scattered with random care among the soft folds of the Hill Country seventy miles northwest of San Antonio, and fifteen miles east of VME Triangle Port 8.

In those buildings lived and worked the technical representatives of the Inter-Federal Council. In the quiet, almost academic atmosphere, personnel was selected, trained and assigned to the projects formulated by Central Scientific. When the projects were received in the main offices of Central Assignment, they were cold, terse documents, stating all that Central Assignment needed to know—setting up specifications for human beings. By the time Central Assignment finished with each project, flesh and blood had been selected and trained to fill the specifications.

Field representatives in the familiar gray uniform of Central Assignment roamed Earth, Venus, Mars —hunting for the precise individuals needed to fill quotas for projects.

Frank Allison had started as a field representative, and, gray in the service of CA, had worked himself up to where he was responsible for the Executive Requirements Section of Colonization Projects.

There had been five colonization projects. The sixth, Project Flight 81 to Planet L, was slated for takeoff in sixty-two days. So far one project flight had been lost twenty-one months out with all hands. The world had celebrated the success of one project flight. The return trip was in space. Three projects, 74, 77 and 80, were still outward bound.

Frank Allison finished sorting the papers on his desk, sighed heavily. For a time it had looked as though CA would fall down on 81. He had been responsible for procuring thirty-one men and women, the persons who would be in charge.

Frank Allison was a small man with a surprisingly florid face and an air of nervous vitality. That vitality had kept him going when it had looked as though the very important slots of flight executive officer and pilot would not be filled.

But, with the deadline near, Hiram Lee, an ex-pilot, had passed the psychological and technical tests. Shane Brent, the field representative who had enlisted Lee had volunteered for the exec job.

The trouble with colonization recruiting as against exploration recruiting was that psycho demanded mature and stable people, the ones least likely to wish to go on a colonization project with, in spite of the good records so far, a calculated risk of four to one.

Thirty-one sheets of paper. Thirty-one case records. He buzzed the girl, handed her the sheets and told her to make micrograph file copies before bucking them over to the front office. She was a worried-looking girl with stringy blond hair. She held the papers in her hand and said: "You ought to take a week off, you know, Mr. Allison."

He smiled. "Maybe I will, Janet. Soon as I get all the assignments out on Project 82." He thought of the new project coming up and frowned. "That's going to be a mean one, Janet. Forty-three exec-

utive personnel. Five and a third years en route."

"But the deadline is thirteen months from now, Mr. Allison. Can't you take just a little time off?"

He sighed. "I suppose I should. Look. Tomorrow we'll assign the rest of the specs to the field boys and I'll ask for a full week. Just to keep me from changing my mind suppose you make reservations for me at some nice quiet spot."

She lost her worried look. "I'm glad, Mr. Allison. I'll find a quiet place. Why don't you go home now and get some sleep?"

Allison agreed, stood up, yawned, stretched and walked out of his office, out of the small blond stone building in which he was king. He wondered if he ought to walk over to the school buildings and check with Carmody just to make certain that there had been no unexpected rejects on the executive personnel for 81. No use asking for trouble, he thought. I'll just head back to the room and sleep forever.

One of the requirements of the head physician of CA was that all personnel should be forced to walk from building to building. Usually Allison was glad of that rule. But in his tired state, even walking seemed like too much of an effort. He felt a deep, stunning weariness in him and he yawned again. Reaction. Too much work at too high a pitch. Have to take it easy for a while.

His one room apartment was in Unit C-11, a half mile from his office building. He trudged wearily along, little puffs of Texas dust rising with each tired step. Down the hill to Avenue A, along Avenue A toward Unit C, slowly by Unit F, Unit E—

Suddenly he stopped, his face oddly slack, his mouth open slightly. A small tired man standing very still in the late afternoon Texas sun. He was twenty feet from Unit E. He seemed to be waiting for something. Slowly he turned and walked into Unit E, along the ground floor corridor. He was no longer conscious of what he was doing, the last shred of volition disappearing as he walked down the hall. A door opened and he walked into a darkened room. He sat on a straight chair and faced a blank wall.

A soft masculine voice said: "You will give technical details of Flight 81."

In a flat dead tone Allison said: "Project Flight 81 from VME Triangle Port 8 to Planet L. Target planet is .9663 Earth weight, mean temperature approximately 1.14 times that of Earth. Circles a sun rated Class G on Harvard Spectral in a 521 Earth day orbit. Hoffman Identification proves an oxygen atmosphere and probably plant life of a low order. Distance 4.91 light-years."

"Give technical details of the flight itself."

"The flight uses a Dantry-Wells hull originally built to carry eight hundred eighty passengers and a

crew of twenty-eight on the VME Triangle. The hull has been completely refitted with supplies, equipment and space for four hundred colonists, crew of fifty and fourteen special technicians. Calculated risk of survival 4.328 to 1. All personnel complete. Commanding Officer—Walker Howe. Flight can't carry heavy enough plates on A.-Room to check out radiation from quantity of drive bricks necessary for round-trip flight. Chester Denvers, Flight Physicist, is taking equipment to refine drive bricks from pitchblende rich in uranium salts as the Hoffman Identification proves such deposits present on Planet L."

"What is the flight plan?"

"Constant acceleration to midway. Eighteen months of the thirty-six month trip will be at acceleration over the speed of light. Since the warning devices won't work adequately at that speed, it is the greatest risk period."

Frank Allison sat, unthinking, in the darkened room. After a few moments of silence the voice said: "Here are your instructions—"

Frank Allison stood twenty feet from Unit E. He wavered and touched his hand to his forehead, looked uncertainly at the setting sun. Just dizzy for a moment or two, he thought. I really must be bushed. That sun seems to have gone down pretty fast. Wearily he walked to his own unit, up to his room, yawned as he undressed, and, in a few minutes he was sound asleep.

Caren Brent, married to Shane Brent two weeks before, sat at the desk in their small apartment in the living quarters adjoining the training school at CA. Brent sat, slouched in a chair, watching her as she worked. He knew each fine line of her oddly angular, oddly graceful body, and he felt amused at himself as he realized that he was filled with the smug and fatuous pride of any man who counts his blessings as he watches a lovely bride.

Brent sat with an almost animal stillness. He was flat and hard, giving the impression of explosive violence, carefully controlled. His eyes were heavy-lidded, sleepy.

Caren sat staring at the open book, her left elbow on the desk, her left hand tangled in her blond hair. Frequently she made small neat notes on scratch paper.

She turned around suddenly, her face full of mock woe. "I hate you, Shane."

"And I hate you too, darling. Why the sudden rush of affection?"

She hit the book with her small fist. "The trouble is to get what's in here," she said, "into here." She tapped her forehead with her knuckles. "I trained to be a dancer, honey—not a colonist. Can't Central Science think of some better way to do this than by studying?"

He grinned at her. "You haven't got much to learn. A little botany

and nutrition so that you can cook for me. A little medicine so that you can take care of me and yourself and the dozen or so kids we'll have. A few handicraft items. Weaving and stuff like that."

She looked at the ceiling. "Why, oh why, did I let myself be talked into marriage?"

He laughed. "I thought you talked me into it."

She stood up quickly and said: "O.K., friend. I'll show you what you married. This is called the Dance of Stupidity."

Shane Brent watched her with delight. He remembered the night at Brownie's on the Allada Strip. It was on the Venus trip when he had recruited Hiram Lee. She had danced that night. The Dance of the Harid. Caren was an interpretive dancer, a good one.

He watched her as she let her face go slack, the tip of her tongue protruding slightly from the corner of her red mouth, her eyes wide, vacant and slightly crossed. She stuck her elbows out awkwardly, her hands flapping limply, her feet shambling in eccentric rhythm, a completely ugly and completely perfect representation of all the stupidity of mankind. Even as he laughed, his breath caught in his throat at her artistry.

When she came near he caught her wrist and pulled her, warm and eager, down into the deep chair with him. He found her lips. At last he said hoarsely: "I've got no right to take you away with me like this. You should stay here. You should dance your whole life through with all the people of the world watching you."

She looked up into his face, ran her fingers slowly along the line of his cheek and jaw. "I will dance my whole life through, my darling. For you alone."

He kissed her again and finally she pushed him away and said: "Cease, sire. I must get back to my lessons."

She stood up, smiling down at him. Her smile faded. "What's the matter?" he asked.

She shrugged. "I'm just a silly old married woman, Shane. Everything is too perfect. Nothing has ever been this perfect for me before. I keep feeling that something will spoil it. When I saw Dick, I thought—" She stopped suddenly.

Brent glared at her. "You saw Richard Crewson? You didn't tell me!"

She came back into his lap and said: "Don't be angry, Shane. Please! I didn't want to mention him. He . . . he won't bother me again. I told him that I had married again and that if you ever caught him bothering me, you'd break him into small pieces."

"And I would do exactly that."

"He gave me that oily grin of his and said that he'd be around where he could keep an eye on me. I told him that he'd better take a good look because pretty soon Caren wouldn't live here any more."

. Brent frowned. "That was a violation of security, you know."

"Oh, he's harmless. Besides, he knew all about 81. He wished me a good trip and said he hoped we'd make a nice landing that would drive the ship right down through the surface crust of Planet L."

"Nice guy! Say, I wonder how he knew all about it?"

"He works in CA some place. Education Branch, I think. Not the one at the school here but the one that's concerned with outside institutions."

"I know what you mean." He held her tightly. "When I think that once upon a time you belonged to that guy—"

"Please don't say that, Shane," she whispered. "It was so long ago, and I've never really belonged to anyone but you. You know that."

He couldn't break his mood of bitterness. He tried to smile and saw, in her eyes, that she understood his mood. She put her arms around his neck and pulled his lips down hard onto hers.

Shane Brent sat slouched in a chair on the opposite side of Frank Allison's desk and, with a troubled look on his face, stared at his hands. He glanced over at Allison and said: "This isn't like you, Frank. Usually you're satisfied with all the psycho reports and the school report, you let an assignment ride. I like this Walker Howe. He's got a lot on the ball."

"I've told you once, Shane, and I'll tell you again. The final authority rests with me. If I didn't have the authority, I'd give up this job. I can cancel anyone out of any project on my say-so without reasons."

"But it isn't like you to hold back the reasons."

"I've decided that Walker Howe isn't the man we want to command the project flight."

"But why, Frank? Why?"

"I have a feeling that he won't do. I'm eliminating him and appointing Channing Long. Long passed all the tests, too."

"But don't you remember that you said no on Long because he was too glib?"

"I might have thought so at the time."

"I still think so, Frank. After all, I'm going to be the executive officer. I'd almost rather not go than work for Long."

Allison looked stern. "Brent, you made your choice when you took off that gray uniform and put on training school whites. You no longer have anything to say about selection. Understand?"

"Sure, I understand, but you never got haughty with me before, Frank."

"There's always a first time."

Shane Brent stood up. "O.K., Allison. Have it your way. When does Long report?"

"He's in the training area already."

"And what happens to Howe?"

"We'll keep him on the reserve list for 82 and give him additional orientation."

Brent turned without another word and left Allison's office. After he closed the door behind him, he stopped at Janet's desk and said, with feeling: "It sure was a tough break to find out that Howe wouldn't do this late in the game, wasn't it?"

Janet looked up quickly, obviously puzzled. "But we didn't find out anything! Mr. Allison just said yesterday that he didn't want Mr. Howe to be in charge. Nothing came in about—" She stopped suddenly. "You aren't with us any longer," she said accusingly. "I shouldn't talk to you like this."

Brent looked at her quietly. "Maybe you should," he said softly.

Snaydon, acting head of all personnel procurement for colonization flights, said: "Brent, I am afraid that you are letting your own personal likes and dislikes influence your judgment. Allison has been one of our best men for years. We can't check on him all the time. If he changes the assignment of the commanding officer for 81 at the last moment, we trust him to make that change in the best interests of the success of the project. My advice to you is to just forget all this and use the rest of your training and indoctrination time learning to work with this Channing Long. I'm certain that he must be an able man. Good day to you, Brent."

A twenty-foot model of the converted Dantry-Wells hull, cut away to show all interior compartments, was placed on a low table. Shane Brent pointed to the small compartment forward and said to the husky, black-haired man at his elbow: "That's your headquarters, Mr. Long. Over here is the board that gives you instant communication with every part of the ship."

The husky Mr. Long wasn't as tall as Brent, but he was half again as big around. His jaw was square and determined. "Ah, I see. And where will you be, Brent? Just across the passage here?"

"That's right. I have a standby call board. We both have visiplates showing pilot's station and reproduction of the basic flight instruments. The log is kept in my quarters."

Mr. Channing Long sighed. "Three years is a long time," he said.

"Recreational facilities are pretty complete. We have a big three-di movie file, complete game libraries and, of course, access to the seventy thousand micrograph books in the permanent library. I will assign practice projects to colonists to keep them on their toes."

Long looked at the tiny cabins of the colonists. "They'll be pretty cramped, won't they?"

Brent grinned. "All the colonists are young couples, Mr. Long. I have a hunch a lot of them will like it that way."

"How about the landing at the

other end of this three-year trek?"

"We'll circle the planet. It'll be up to you to pick the spot. Then the four hundred colonists help unload all the tons of equipment and start building. The physicists work with the geologists in locating all mineral deposits. The planet is photographed and mapped from the air with our little jet cruiser that we unload and assemble. All this will take around a year. Then the ship heads back and Central Economics makes an arbitrary Inter-Federal assignment of all useful mineral deposits according to needs and population. The second trip out will take the equipment necessary for the exploitation of the useful deposits found on Planet L."

"You make it sound easy," Long said, smiling.

"Anything that takes seven years isn't easy, Mr. Long. I expect it to be tough. As you know, I'm a colonist, too. You have to find yourself a new exec from among the crew and technicians for your return flight."

"We carry weapons, of course?"

"Of course. No telling what we might run into. For my money, we take too much. We use too much tonnage on the stuff."

"There is pitchblende on Planet L?"

"Hoffman Identification hasn't missed yet, Mr. Long."

"And we carry equipment to make drive bricks?"

"Otherwise you wouldn't get back to Earth."

"Can the same equipment be used to provide additional atomic weapons?"

"I imagine so. But if we get in a spot where the weapons we take along aren't enough, we might as well give up. What do you have in mind, Mr. Long?"

"Oh, nothing. Nothing at all." To emphasize his answer, Channing Long laughed. His laugh had a singularly empty sound.

Brent stared at him for a moment, and then continued showing him the details of the ship.

Shane Brent bunched the pillow under his head and leaned back, staring up at the ceiling. Caren, propped up on her elbows, stared at him.

"Shh!" she said. "The ogre is thinking. Don't disturb the ogre."

"Have I been an ogre?"

"You have been and you are in a foul mood, darling. Tell your gay and cheerful little stupid wife what irks thou?"

"I am irked by Mr. Channing Long. Mr. Channing Long is an irker of long standing. The man is oily. Even if he did have a terrific job as Inter-Federal advisor to Central Political he's still oily. Bright but oily."

"You'd better learn to love him, dearest, if he's going to give you orders for three long years. That'll make two of us giving you orders. Here's an order. Cheer up!"

"Would if I could." He yawned and stretched. "Ought to get my

mind off my troubles. Say, do you think it would hurt my record if I looked up that ex-husband of yours this evening and beat him up? I need the exercise."

"Beat me up instead. You're supposed to beat wives when you feel low. Besides, Central Political might look at you askance if they found out that you don't like either of their local ex-employees."

He sat up suddenly. "What? Did Crewson ever work for CP?"

"For years. He didn't get anywhere, but they paid him a wage."

"That's funny."

"What's funny? He had to do something."

"I mean about Crewson working for the same outfit as Channing Long. Think they know each other?"

She shrugged. "They could. What difference would that make?"

"I don't know as it would make any. I feel like a man putting a jigsaw puzzle together. Except that somebody has hidden the pieces."

"Ogre!" she said softly.

"Ogre's wife," he said, reaching for her.

In the darkness he found the button on the headboard of the bed, pushed it and glanced at the clock dial image thrown on the ceiling. Ten to three. Caren was breathing gently beside him. She murmured once in her sleep and he reached out, touched her blond hair with his fingertips.

Careful not to awaken her, he dressed in the dark and let himself out of the apartment. A pale moon was riding high, turning the walls of the buildings to silver. Off in the hills a coyote yelped, a distant dog answered.

Brent lit a cigarette, wondering why it was that he couldn't sleep. He walked slowly up the hill toward administration. Soft white light shone from the windows. He walked in. Three of the girl clerks were drinking coffee. They looked up at him in surprise. "Why, hello, Mr. Brent! Want some coffee?"

"No thanks. What goes on?"

"A report to get out. One of the girls is sick and we got behind. It's got to go out in the morning. Anything we can do?"

"I heard a little while ago that an old friend is in the Education section. Dick Crewson. Can you look up his address for me?"

The dark-haired girl smiled, walked over to the automatic file and dialed Richard Crewson, pushed the address button. "Unit E—15," the mechanical voice rasped.

"Thanks," Brent said, and walked slowly out.

He stood in the moon shadows near Unit E and smoked another cigarette. His conscious mind tried to dip into the subconscious and find some pattern that constantly eluded him. Something to do with Crewson, with Long, with Howe, with Allison, with 81.

On impulse, he flipped the cigarette away, went silently into the

building and found Room 15. He tapped on the door, listened.

After a few moments he heard cautious steps inside the room. The steps stopped on the other side of the door, a cautious voice said: "Who is it?"

"Long," Brent said.

A light clicked on inside the room. The lock clicked and, as the door opened, Richard Crewson was saying: "Chan, you shouldn't—"

The voice turned into a gasp as Brent came in fast, closed the door and leaned against it. Richard Crewson was Brent's age, but there was a puffiness about his hands and wrists, an unhealthy pallor around his mouth, a limp dank look about his hair. His eyes nested in small pads of damp white flesh.

Crewson's surprise turned to contempt. "Ah, the heroic husband!"

"Buddy-buddy with my boss, hey Crewson? Chan you call him?"

"How's married life, Brent? Hope you get more affection than I did."

Brent took a quick step and backhanded Crewson across the mouth, splitting his lip. Crewson explored the split with the tip of his tongue. "Nice work, hero. You know from Caren that I'm sick and I can't put up a scrap. It's just about your speed to slap me around. Go ahead. I won't try to stop you. Maybe it will make you feel better about Caren and me. It does bother you, doesn't it?"

"I didn't come here about that."

"You just think you didn't. I knew you'd find some excuse to come around and rough me up. It was in the cards."

Brent put his hand against Crewson's chest and shoved him back toward the bed. "Sit down, Crewson. I'm taking a look around."

"Go ahead. When you're through I'll send in the complaint to administration. They'll probably cancel your sailing orders. Caren'll be proud of her big husky boy."

Brent ignored him. He didn't know what he was looking for. He tried to act confident. What Crewson said was right. They wouldn't like this up in administration. Psycho, on hearing of it, would probably change their valuation. He had gone in a little too far. He cursed himself for walking into it blind.

As Crewson sat on the bed, looking amused, Brent carefully searched the room. He found clothes, personal letters of no importance, a small micrograph projector with a small pornographic projection library, a bulky three-di camera with masked binocular lenses. Nothing else. Nothing at all.

Crewson laughed aloud. "Any clues, junior?"

Brent looked over at the window. His sense of direction told him that it must face the walk. There was something out of key in the room. He knew that he had seen something which should puzzle him. Doggedly he searched again.

The cubical room was colorless,

impersonal. He looked at the bare walls. Other residents usually defeated the bareness of the walls with bright prints. No pictures—

Brent suddenly snapped his fingers. No pictures.

He went back to the bulky camera, picked it up. He faced Crewson and saw the quick flicker of something beside amusement in Crewson's eyes.

"Amateur photographer, hey?"

"Is that against the rules?"

"The camera looks used. Let's see some of your results."

"I've loaned my pictures. They aren't here."

"All of them? You mean you never take bad pictures, not even one that you'd be ashamed to loan? You must have loaned your three-di projector, too. All you've got here is the micrograph projector for your dirty two-dimensional scenes."

"I loaned the projector, too."

"Generous, aren't you? You loaned them to somebody here at CA?"

"No. Outside."

"Come on then. We'll go over to administration and I'll get permission on the screen to haul this dear friend of yours out of bed and ask questions about your pictures."

Crewson bit his lip. "I lied to you, Brent. I borrowed the camera. I haven't used it yet."

"Who did you borrow it from?"

"Channing Long."

Brent smiled briefly, put the camera on the edge of a table and unstrapped the leather case. The surface controls which weren't concealed by the leather were standard for three-dimensional equipment. The controls exposed by the removal of the case were strange. At the base of the camera was a heavy-duty electrical inlet.

He heard Crewson's quick movement behind him, turned in time to catch the man at the door, haul him back.

Allison, gray with fatigue, sat behind his desk and said: "Brent, this had better not be a case of an overworked imagination."

Brent stood by the door, his shoulders against the wall, his thumbs tucked under his belt, his eyes sleepy, his mouth firm. Crewson sat across the desk from Allison trying to look at ease. His shaking hands betrayed him.

The office was silent. The camera that wasn't a camera stood in the middle of the desk.

At last, when the knock sounded, Brent opened the door to the technician that Allison had called. The man looked rumpled and irritable.

Allison pointed to the cameralike object. "Tell us what that thing is, Brewster."

The man stepped sulkily to the desk, slid it out of the leather case. His irritable air disappeared. For a moment he was absolutely motionless, then, with quick fingers he unsnapped the trap in the back, turned it so that the light shone down into the mechanism.

"I'll have to report this to CS, Mr. Allison," he said.

"Never mind that. I don't care what you do. What is it?"

"Fellow named Gaus invented it about twenty years ago. They're on the forbidden list. Called an Encephalogram Projector. What it does is duplicate, on a stronger level, electrical emanations from the brain. These electrical impulses can be beamed at an individual and he'll do whatever the projector is set for. You make a record of a man, say, falling down. You pick up the encephalogram for that action then beam it at somebody else. They fall down too. The gadgets were outlawed because they push anybody into a perfect hypnotic state. Sort of puts their defenses down. Also, with a thing like this you can produce foolproof murders."

Allison frowned. "Very interesting, Brent, but what has it got to do with getting me out of bed. I'm not in that field."

"Frank, suppose you were hypnotized. Suppose you were given the posthypnotic suggestion to cancel Howe out of 81."

"Impossible!" Allison gasped.

"Don't jump at it, Frank. I found the camera in Unit E. You walk by there on your way home. Ever have any funny feeling when you walked by? Like the day before you decided to bounce Howe?"

Allison got a faraway look in his eyes. He said slowly: "I remember I had a sort of dizzy spell. Almost a blackout. The sun seemed to take a sudden drop toward the horizon."

The technician said: "It would feel like that."

Brent turned to him. "I want to use this gadget on our friend over there, Mr. Brewster."

"I can't go along with that. We've got standing orders to bring in all forbidden items whenever we run across them. This has a high priority on the list."

"We'll cover you on that. We cut Allison's screen over to reproduction and make a tape on it and give you a copy of the tape to turn in with the projector. The tape will be your evidence against whoever used it."

Brewster shrugged. "I don't like it, but I'll go along with it."

Crewson stood up. "I absolutely refuse to have any part of this. I have certain rights and—"

Brent pushed him back into the chair. "Tomorrow you've got rights. Tonight you're a pigeon. Shut up!"

Brewster left the office and came back with a cable which he connected with one of the office outlets. He changed a few small adjustments on the cameralike projector. "Move him over here so the screen gets him," he said.

Brent moved Crewson, chair and all. Allison turned the screen on and checked the controls for reproduction. Brewster said: "I don't know what this will make him do. If he tries to leave, just grab him and hold him until he stops moving.

He'll keep moving until the length of time is gone that it would take him to do whatever this gimmick tells him to do."

Crewson had his mouth open to object when the switch clicked on the projector. His mouth closed abruptly and all expression left his face. His underlip sagged away from yellowed teeth. His eyes were glazed. He stood up slowly and turned toward the door. Brent grabbed him around the waist. Crewson didn't fight Brent off. He merely continued to make grotesque walking motions, his face dead.

After several minutes Crewson stopped moving. Brent put him back in the chair. The projector hummed for a few seconds more and then stopped.

"Was Mr. Allison hypnotized?" Brent asked.

"Yes. Channing Long handled the projector. Mr. Allison came into the room and told Mr. Long all the details of 81. Mr. Long gave him the posthypnotic suggestions to forget the hypnosis, remove Mr. Howe as commanding officer and appoint Mr. Long."

"Why was this done?"

"Mr. Long has been anxious to be in a position of authority on a flight to a planet which contains large quantities of pitchblende. He is a member of Alpha."

Brent gave Allison a puzzled look. "What is Alpha?"

"Alpha is a group of men and women formed of executives of Central Political. We despise the present peaceful regimentation where all races have equal wealth and equal opportunity. We are all of one race and we feel that our race should rule the known world, instead of the present hybrid authority. The agents of Alpha in Central Scientific discovered that there was a possibility of 81 going to a planet containing the materials we need. Mr. Long was selected to apply for the position of commanding officer of the project flight. Mr. Howe was selected instead of Mr. Long. I was transferred to CA to find out whether or not the target planet was a planet we wanted."

"How did you seek to do that?"

"Caren, my ex-wife, was brought in range of the Encephalogram Projector. She gave enough data to warrant my reporting favorably. As a result of my report Mr. Long arrived and planned to use the same system on Mr. Allison. Mr. Allison confirmed what the girl told me, though in greater detail."

"What did Alpha hope to do with Planet L?"

"On the flight, all personnel would eventually be subjected to the projector. During hypnosis they would be indoctrinated with hate for the existing order and love for the alternate which Alpha offers. Planet L would become the first base for Alpha conquest. All colonists not of the proper race would suffer accidents. The ship would not return to Earth until it had been completely outfitted for war. Then Alpha, with its nucleus on Earth,

would be in a position to dictate terms."

"Do you know the names of the members of Alpha?"

"I know the names of four. No member knows more than that. It is said that the total organization numbers two hundred. Most of them are in Central Political, a few in Central Scientific and several in Central Assignment."

"Then the organization is cellular. The four you know would know others?"

"Yes."

Brent said: "Frank, the answer is easy. We subject the four he knows to this gimmick and get more names. We haul them in and get more that way. Finally we get the entire setup. On second thought, we don't do it, Central Security does."

Assembly Hall 9 was filled with the colonists, crew and technical personnel of Project Flight 81. They all wore the white dress of the training school. They were not adventurers, people seeking escape. They were young—but they were calm, confident, conscious of the risk to be taken, sure of the rewards for taking that risk. A unit of mankind reaching out toward the stars.

Walker Howe stepped onto the platform. He stood in the silence and looked at them. At last he said: "Personnel of Project 81. I have been reinstated as your commanding officer. Take-off is fifty-seven days and eleven hours from this moment. Central Security is at this moment untangling the last deadly strands of a plot to take over your minds and bodies during the flight and make all of you tools of an armed uprising engineered by men who still cling to anachronistic pride in race."

"Before take-off, Central Security may find that one of you in this hall may be a traitor to our world. I hope not.

"I called you together to tell you of this thing and to do away with any feeling of insecurity that may have arisen from my removal and subsequent reappointment.

"This entire situation has made it very clear that, as we leave Earth, we will be as strong as the weakest among us. We have taken the most exhaustive psychological and physical tests that mankind has yet devised. There will be opportunities to test our strength.

"Our flight is as elemental as birth. Our arrowing ship will be the shining sperm of mankind, fertilizing the stars.

"We will be worthy of the honor."

He turned and walked off the stage. The applause caught him as he reached the wings. Shane Brent, sitting beside Caren in the front row, glanced at her face in profile. Her lips were parted, her eyes shining bright.

THE END

ENDOCRINOLOGY IS TOUGH

BY JOSEPH A. WINTERS, M. D.

Living cells have a neat way of taking any handy molecules, tacking a few new atoms here and there, and sending them out to do big business. The endocrinologist then has the terrific job of locating which, of a few million compounds, is the one doing the business, where it comes from, what it's made of, and, finally, how to duplicate it. And man, can those hormones disguise themselves, and lose themselves!

Anyone who has ever had a connection with research work, no matter how remotely, realizes it is an extremely frustrating hobby. The boys who have written about the romance of research have given an entirely erroneous idea. According to these romanticists, a reasearch worker is a starry-eyed idealist who moons around the laboratory for short intervals, then rushes out shrieking, "Eureka! I've found it! Pandemonium sulphate, when added to fristeris, gives the moisenflay effect!"

'T ain't so, brother, 't ain't so. Scientific research work of any sort invariably means long hours of labor working out apparently insignificant details, frustration by the perversity of inanimate objects and final results that are equivocal at best. You readers of our favorite magazine have been told this before. J. J. Coupling has sung the sad song of the problems connected with vacuum tube research. Another gent has told of the difficulties in adjusting a ship's compass to terrestrial magnetism. According to their stories these are very tough problems.

But endocrinology is tougher.

Endocrinology, for the benefit of those who came in late, is the study of the glands of internal secretion. These glands pour their secretions, called hormones, directly into the blood stream.

Endocrinology is a comparatively young science. The first actual research work was done by a character named Berthold in 1849; he showed that if testes were transplanted into a capon the bird would resume the normal appearance and activity of a rooster. There were other workers, of a sort, in the field of endocrinology long before him, of course. The gent who got the bright idea of making eunuchs of the men who were to guard the

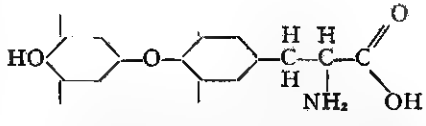
harem was, in a sense, an experimenter in endocrinology. He reasoned that the gonads controlled the male sex drive and the ability to become a father, and that these were faculties dangerous to the safekeeping of more or less valuable chattels. Remove the organs and you remove the attitudes simultaneously—Q.E.D. Most of us, however, have a personal antipathy to such goings on.

Endocrinologic research of today is considerably more difficult than the crude surgery of depriving a man of his gonads and the cruder observations noted thereafter. It's a tremendously difficult field. There are several reasons for the difficulties.

The first reason is that some hormones are present in unbelievably small amounts; yet are spectacularly effective even in low concentrations. For example, epinephrine—also called adrenalin—which is the hormone of the central portion of the adrenal glands, can be detected biologically in a dilution of one part in *three hundred million.* To help visualize this astounding figure, some boy who was handy with a slipstick has figured thus: a watercart holds six hundred twenty-five gallons of water. Take eight thousand of these carts, dissolve one ounce of adrenalin in the water contained in all these carts; inject one cubic centimeter of this solution into a test animal and you will see the characteristic effects of this hormone. This degree of dilution is even greater than that seen in a nightclub highball.

Another reason for the difficulties involved in endocrinologic research is the vital importance of some of the hormones. The presence of a small amount of hormone can make the difference between normality and gross abnormality; it can even make the difference between life and death. As an example of this, consider cretinism, a condition caused by congenital absence of thyroid function. A cretin is a stunted, pot-bellied idiot with dry skin, protruding tongue and an expression like last week's custard pudding. If his body could manufacture three and one half grains of thyroid hormone in a year he would be normal. We can prevent him from remaining an idiot by giving him the dried substance of the thyroid gland, about a grain and a half per day being necessary.*

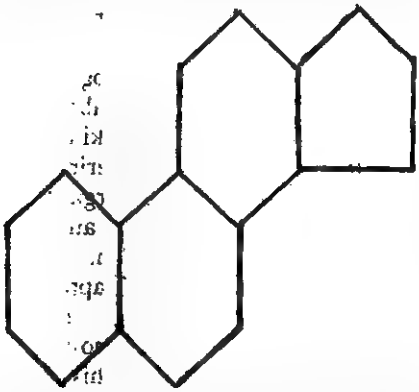
One of the biggest stumbling blocks in the way of progress in endocrinology is in the analysis and identification of the hormones. Thyroxin, the hormone of the thyroid, wasn't too difficult. As you can see from the structural formula, the compound is comparatively simple.



* In case you are not familiar with apothecary's measurements, one grain equals 1/480 of an ounce, or 0.06 grams.

It was isolated by Kendall in 1914, so it is really an acquaintance from years back.

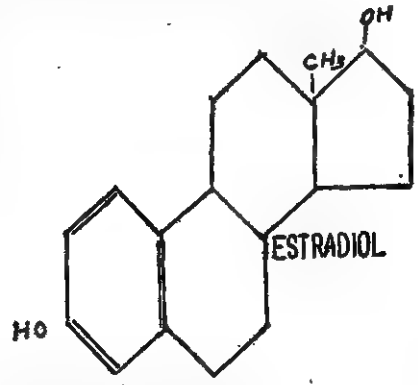
The steroid hormones are another story. These are hormones built around the phenanthrene-cyclopentane nucleus, whose structural formula looks like this:



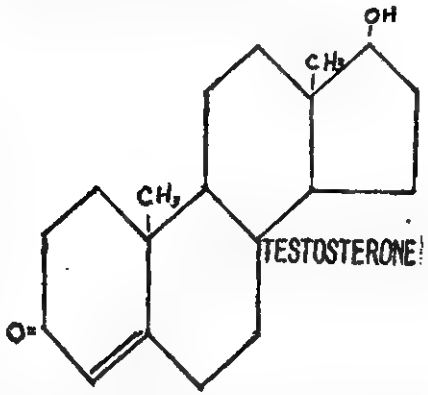
The steroid hormones include the hormones of the ovaries, the testes and the cortex of the adrenal gland.

It is almost miraculous the way these various hormones have been identified and believe me, it wasn't without work. For instance, Messrs. Butenandt and Tscherning, who did the original work on male hormone, had to boil down fifteen thousand liters—that's about sixteen *tons*—of bull's urine in order to obtain fifteen milligrams of male hormone. Don't ask where they got it all. History doesn't seem to give us this pertinent fact.

As a further example of the difficulties involved in the chemistry of the hormones, let me give two more structural formulas. This is estradiol, the most active of the ovarian hormones:



And this is testosterone, the most active male sex hormone:



You don't have to be a chemist to see that one CH_3 group and one hydrogen atom is the only chemical difference between the two. The physiologic difference, on the other hand, is extreme. If a woman were to get too much testosterone her breasts would atrophy, her voice would become deep and husky, she would develop the musculature of a man and might even grow a beard. If a man were to get too much

estradiol, he would lose his beard, his genital organs would shrink up and cease to function and he would become a good prospect for the brassiere saleswoman. And all this from the difference of one carbon and four hydrogen atoms!

When we get to the hormones of the pancreas, the pituitary and the gastrointestinal tract we run up against a problem which still is unsolved. The hormones probably are proteins or protein derivatives and we haven't the vaguest idea what these, or, for that matter, any other protein molecules, look like.

Finally, a very great difficulty in endocrinology is our inability to explain the inexplicable. Take the work of Rowntree and his associates: an extract of the thymus gland, when given to successive generations of rats, does not affect the first generation. But succeeding generations matured much earlier than the normal controls, and this precocity increased with each generation so treated. And if administration of the thymus extract was withheld from one generation of rats, the effect of stimulating precocious development was lost. Why? Nobody knows.

Or take the pineal gland. This mysterious structure, at the base of the posterior portion of the brain, is supposed to be the remnant of a third eye which we might have had in eons past. The philosopher Descartes said that it was the seat of the soul. Neither explanation has been proved. In cases of tumor of the pineal body we see extreme sexual precocity; a girl five years old may be completely developed sexually, may menstruate regularly and be a normal woman, although junior size. And some of these unfortunates have lived long enough to die of old age—at fourteen years! Again, there is no answer to the question Why?

If research in endocrinology is so tough, then, how do we go about it? The usual method of working out a problem is by using experimental animals, by removing an organ and observing the effects on the animal's behavior and metabolism. The earliest example of this approach was, of course, castration. If the testes of any male are removed he loses his aggressiveness, his pugnacity and his interest in females. He tends to become lazy and put on weight. He is much more tractable and, in the case of food animals, his flesh is much better to eat. And note, please, that he doesn't become more female; he merely becomes less male. If the castrated animal is given some unknown substance which brings all these changed functions back to the normal, that substance must contain male sex hormone.

These responses are delicate enough to be quantitatively accurate. The capon—and in case you have never been on the farm, and don't know what a capon is, it's a castrated rooster—has a very small comb. If a substance containing male sex hormone is injected

into the comb of a capon in standard doses and for a standard length of time, the comb will increase in size and weight, proportional to the strength of the hormone. With mathematical gymnastics we can therefore express the strength of the male hormone in capon-comb units.

And while we're talking about chickens and male sex hormone, there's an interesting observation which bears telling. In a flock of hens there is a definite social heirarchy known as the "peck order." Hen A, the boss lady, can peck at all the other hens and they won't peck back at her. Hen B can peck at all the other hens except Hen A. Hen C can peck at all the other hens except A and B, and so on down the line. If we give male sex hormone to one of the hens way down the list on the peck order, she will move up toward the top. The number of places she'll jump will depend on the dosage of testosterone used. And if any of you hen-pecked husbands want to take advantage of this observation, go ahead. I betcha it'll work.

But let's get back to the subject. Another one of the endocrine glands studied by observing effects of its removal is the adrenal. The adrenal has two parts, the central medulla and the peripheral cortex. The secretion of the medulla is the one called adrenalin or epinephrine and is an emergency hormone preparing the body to run or fight; it is not necessary for continued life. The hormones of the cortex, on the other hand, are vitally necessary. If an animal is deprived of his adrenal cortical function, he will die within a few days. Because of this invariable response, adrenalectomized dogs are used for testing the effectiveness of the various adrenal corticosteroids, as the hormones are called.

Still another gland which is removed in endocrinologic research is the pituitary. For this tricky bit of surgery the rat is the animal most often used. These hypophysectomized rats are used mostly for controlling the strengths of various pituitary extracts. For example, if we want to test the ovary-stimulating effect of a new type of pituitary extract we administer a sufficient amount to get a standard increase in weight of the ovaries of a hypophysectomized rat. This amount would therefore contain one rat unit.

At Armour's huge plant in Chicago, they hypophysectomize about two hundred rats per week. It's a very fascinating operation and looks so easy the way the boys do it. The pituitary gland—or the hypophysis, if you prefer—is located at the base of the skull and, in the rat, is about the size of the period at the end of this sentence. To remove it the animal is anaesthetized and an incision is made in the neck. The trachea and esophagus are pulled to one side, exposing the sphenoid bone, which forms the floor of the

skull. On this sphenoid bone you can see a tiny blue spot which marks the location of the pituitary. With a fine dental drill and a tiny probe this floor of bone is removed. A small glass suction tip whose caliber is so small that it would not admit a common pin is inserted into the hole and *zoop!* out comes the pituitary. Two technicians work together on this tidy piece of surgery; one takes care of anaesthesia and opening and closing the incision while the other one does the actual removal of the gland. They have their technique so perfected that less than two per cent of the animals die.

Another fascinating technique in endocrinologic research is the trick known as parabiosis. In this, two rats are joined together, a la the Siamese twins. An endocrine gland is removed from one animal and the effect noted on the other.

As an example, we can take a male and female rat joined in parabiosis. The testicles of the male are removed. Within a few days the female goes into heat and stays that way. The explanation for this is that the hormone of the gonads exerts an inhibitory effect on the pituitary. When the rat's testes are removed, his pituitary gland works overtime, secreting the hormone which stimulates the gonads. This gonadotropic hormone filters through into the female, stimulating her ovaries, resulting in the phenomenon called heat or estrus.

Another interesting point observed in parabiotic rats is that there are no changes in the intact animal. In other words, if you join a male and a female rat together without removing any of the endocrine glands there is no apparent change in either of the animals. You might think that by mixing up the circulating blood of two animals of different sex that the male would tend to become female and the female male. But no, the sexual characters remain unaltered; a male rat in a male-female parabiosis has been able to sire normal offspring.

Still another method of approach, and a very important one too, is that of administering overdoses of hormones to experimental animals. The man who has done a great deal of fundamental work along this line is Hans Selye of Montreal. In one of his experiments he gave large doses of desoxycorticosterone—one of the hormones of the adrenal cortex—to rats and was able to produce arthritis. And it was a true arthritis; microscopic study of the tissues showed the same picture we see in human arthritis. He then took another group of rats, giving them the same amount of desoxycorticosterone *plus* the appropriate sex hormone—and the rats did *not* develop arthritis.

The implication of this, as applied to humans, is that one factor in arthritis might be a deficiency of sex hormone, and that assuring that a patient has a sufficient supply of sex hormone might prevent him

from developing arthritis. Lest this statement stir up false hopes in the mind of any reader who might be arthritic, let me point out that it is doubtful if sex hormones will do anything toward the cure of arthritis, once it has developed.

Selye has also done further work to show that it is probably the pituitary gland which is at fault in the development of hormonal arthritis. You see, the pituitary gland has a number of secretions; these are called tropic hormones or tropins, and are named for the organ which each stimulates. There is gonadotropin, which stimulates the gonads; thyrotropin, which stimulates the thyroid; corticotropin, which stimulates the adrenal cortex, and there may be several others besides these. When there is an excess of one tropin there is a deficiency of the other tropic hormones. Selye has showed than an excess of corticotropin will overstimulate the adrenal cortex and produce the same sort of arthritis as caused by excessive dosage of an adrenocortical steroid. It is also probable that giving sex hormone reduces the pituitary's output of corticotropin—hence the beneficial effect in the prevention of arthritis.

Not only has Selye been able to produce arthritis by giving overdoses of hormones, but he has also demonstrated that intestinal ulcers, high blood pressure, nephrosclerosis —which means hardening of the kidney and is a synonym for Bright's disease—and perhaps disease of the coronary arteries can be produced with this technique.

Another interesting example of work with overdosage of hormones is that done by Dr. Greene of Northwestern University. He gave large doses of male sex hormone to pregnant rats and found that the female offspring had structural changes tending toward the masculine. Large doses of female hormone given to pregnant rats caused feminization of the male offspring. In other words, he was actually able to produce hermaphrodites. It is experiments like these which bring home the fact that no one of us is purely male or purely female. Each of us, rather, is a biological compromise between the two sexes. Those individuals who are a poor compromise, who are referred to by their more fortunate brothers as fairies and queers, are probably that way because of endocrine imbalance. This concept of homosexuality remains to be proved, but offers some interesting material for speculation.

Well, there you have a few ideas about the difficulties of endocrinologic research on experimental animals. It's not so easy, you'll admit. But boy, if you really want something tough, try doing clinical research.

By the phrase "clinical research" we mean treating human patients with endocrine preparations, observing their responses and drawing conclusions from the results. There are just a few minor difficulties:

each individual human has a different way of responding to any hormone, depending on his pre-existing glandular pattern; his environment, over which a doctor has very little control, is going to affect his glandular response; some suggestible individuals will give typical endocrine responses to injections of sterile water, if he thinks he's getting a hormone; and finally, no matter what your conclusions are, some gent who is supposed to be an authority will imply in a polite way that you're a misguided enthusiast and isn't it too bad that they let you out of the home for the feeble-minded.

A brightly shining example of a controversy of this sort is seen in the problem of the cause of obesity. One school of thought says that any person who is overweight is one who has eaten too much. You put in more energy than you burn up and the excess is stored in the form of fat. All you have to do is starve the patient, and he'll lose weight. That's true—but only so far as it goes.

The psychiatrists put in their little oars, too. A person who is overweight is one who overeats because his libido has regressed to the oral level. You figure that one out for yourself.

The school of thought of which I am a valiant protagonist says that most individuals who are obese are that way because of an endocrine imbalance. Proponents of this attitude will give as an example the woman who puts her fat on the sides of the upper thigh, in the regions overlying the trochanters of the femurs. This type of woman frequently has other difficulties of the sort seen in deficiency of ovarian hormone and when she is given that hormone she will lose those fat pads. In many cases her total weight will be unchanged—but her contours will be improved. I've seen that frequently in my practice: a woman with the hypo-ovarian type of obesity will, after a period of estrogen therapy, lose two inches from her waist, an inch from her hips and will *gain* five pounds!

And it's also true that patients with so-called endocrine obesity can't lose weight easily. We frequently see gals who will honestly limit their caloric intake to less than a thousand calories a day without losing a pound. But give one of these gals a little estrogenic substance and she'll lose her hunger for sweets and stick to her reducing diet with noticeably greater ease.

There is one thing which really complicates this glands or gluttony controversy in obesity. Take a woman who is hypo-ovarian and obese; if she is given ovarian hormone she will recover from her deficiency and will lose weight. Or if she is put on a starvation diet she will lose weight and will recover from her ovarian deficiency. No wonder there are fights about the proper treatment of the dietetically overstuffed.

It probably can be resolved to

this, however; obesity and ovarian deficiency have some unexplained common cause, and there is no causal relationship between the two. By treating either difficulty you will accomplish the same end result. However, so far as the patient is concerned, it is much easier for her to get at the endocrinologic difficulty first; she'll probably have to do some dieting later, but the doctor can make it easier for her. And needless to say, this is the *only* correct attitude and anyone who doesn't agree with me is probably a fugitive from an institution for morons.

Yes, there certainly are difficulties in doing clinical research. Here's another example of the tribulations which can result when one tries to show that there might be another way of thinking than the conventional one. It is my personal belief that there is such a clinical entity as subclinical hypo-ovarianism—a minor deficiency in the hormonal function of the ovaries, not enough to cause an obvious disease process, but enough to keep a woman from enjoying the best of health. It is a concept quite similar to that held now about vitamin deficiencies. When vitamin B was first discovered, it was thought that a deficiency in this group of chemicals gave you beri-beri, pellagra or some similar disease. You either had it or you didn't have it. Now we realize that there can be mild deficiencies, enough to cause such vague complaints as constipation, muscular aching or increased fatigability, but not enough to give rise to an actual, well-defined disease condition.

It's not easy to get the majority of physicians to accept that concept of subclinical deficiencies in ovarian function. I remember attending a medical meeting when a physician of national renown expressed his opinion very forcefully on the use of the word "subclinical" as applied to endocrine deficiencies. As was said before, that adjective merely means that a condition is not sufficiently severe to present a characteristic and unequivocal picture, that it has not reached the stage where it can be diagnosed in the clinic. Our expert said: "The word subclinical is derived from the Latin *sub,* meaning 'under' and the Greek word *klinikos,* meaning 'pertaining to a bed.' Literally translated, subclinical means under the bed, and that is where all such diagnoses belong, in the receptacle commonly kept there." There, my friends, is a beautiful display of semasiologic pyrotechnics—and you can't argue against that sort of thinking, either.

There's another type of clinical research which is fortunately not so productive of that sort of learned back-biting. That is the case study. In this there is a thorough analysis made of the patient who shows some usual symptoms in the endocrinologic field. Besides the usual complete history and physical examinations, studies are made of

the blood counts, various chemical substances in the blood, the basal metabolic rate, the amounts of various enzymes in body fluids, the excretion of various hormones and, if the physician is lucky, he'll get an autopsy. It's rather ghoulish the way a doctor can wait patiently for an interesting case to die. It doesn't mean that he *wants* the poor guy to cash in his chips—but that curiosity which characterizes every good doctor sometimes pushes his more humanitarian feelings out of the way. Take John Hunter, the famous English physician—he actually stole the body of a man whose skeleton he wanted, and that skeleton is still in an English medical museum today.

No, the profession seldom resorts to body-snatching these days. Instead we publish case reports something like this: An apparently normal girl, two years after the onset of menstruation at the age of fourteen, suddenly ceased menstruating and began to grow a beard. Her voice became deeper and coarser, finally settling to a definite baritone. Her breasts were almost as flat as those of a man and the distribution and amount of body hair was typically masculine. She developed an enlargement of the abdomen, which ultimately led to surgery. Operation disclosed a large, cystic ovarian tumor; when examined microscopically, tissue resembling that found in the normal testicle was seen. The diagnosis was arrhenoblastoma—a type of tumor which secretes large amounts of male hormone. The patient, incidentally, became feminized again quite rapidly. Within four months after the operation she had developed large breasts and had to shave once in five weeks instead of every three days.

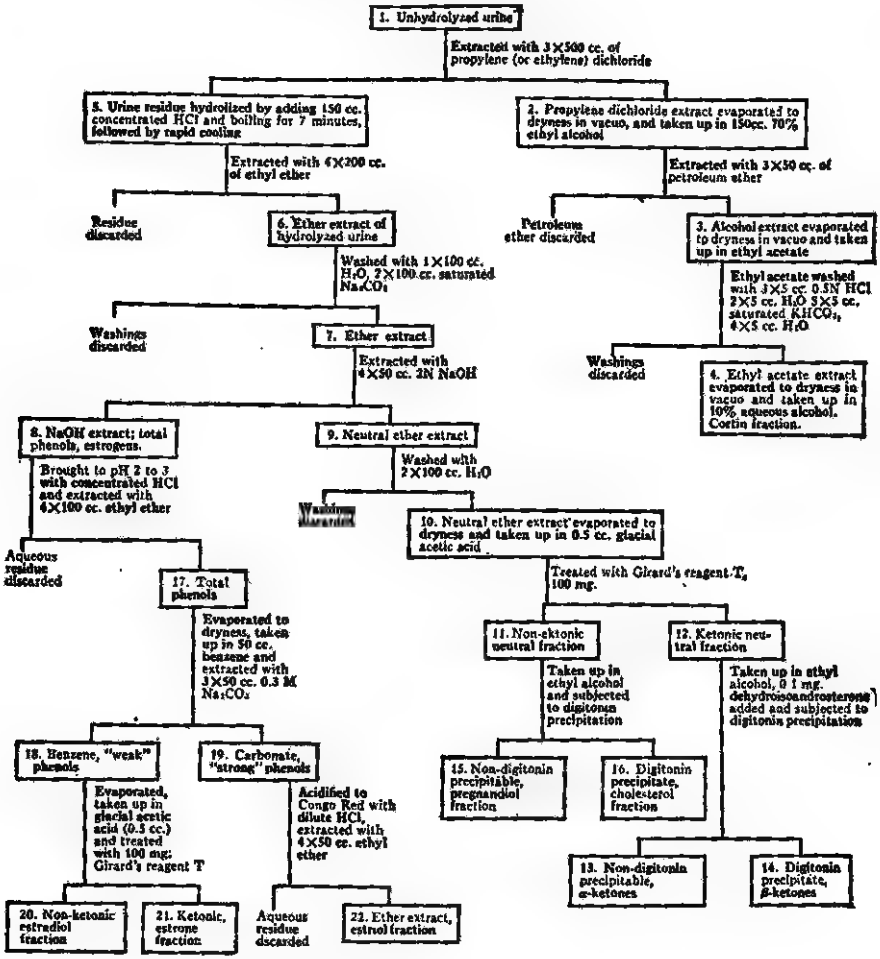
Such case studies are valuable, in that they show us the influences of hormones on the body economy. They also impress on us the fact that the human body is a terrifically complicated mechanism.

In spite of its complications we're gradually finding out a little more about it every day. For example, we now have some very fancy, not to mention high-powered, tests for hormones. They're not simple, though. Take a look at the chart reprinted from the *Journal of Clinical Endocrinology* on page 124. That shows the sort of procedure used to separate the various hormones in the urine. After the separation comes the further work of analysis of each fraction.

Analysis of hormones can be done by various methods. One has been mentioned before—the capon test for male hormone. Another test depends on the examination of vaginal smears in spayed mice. A test for insulin depends on the length of time it takes a mouse to lose consciousness after being given insulin.

Or, instead of using animal tests, we can use colorimetric determinations. This method is based on the fact that the intensity of color of

TABLE II. FRACTIONATION OF URINARY STEROIDS[1]


1. Unhydrolyzed urine
Extracted with 3×500 cc. of propylene (or ethylene) dichloride
5. Urine residue hydrolized by adding 150 cc. concentrated HCl and boiling for 7 minutes, followed by rapid cooling
2. Propylene dichloride extract evaporated to dryness in vacuo, and taken up in 150cc. 70% ethyl alcohol
Extracted with 4×200 cc. of ethyl ether
Extracted with 3×50 cc. of petroleum ether
Residue discarded
6. Ether extract of hydrolyzed urine
Petroleum ether discarded
3. Alcohol extract evaporated to dryness in vacuo and taken up in ethyl acetate
Washed with 1×100 cc. H2O, 2×100 cc. saturated Na2CO3
Ethyl acetate washed with 3×5 cc. 0.5N HCl 2×5 cc. H2O 3×5 cc. saturated KHCO3, 4×5 cc. H2O
Washings discarded
7. Ether extract
Washings discarded
4. Ethyl acetate extract evaporated to dryness in vacuo and taken up in 10% aqueous alcohol. Cortin fraction.
Extracted with 4×50 cc. 2N NaOH
8. NaOH extract; total phenols, estrogens.
9. Neutral ether extract
Brought to pH 2 to 3 with concentrated HCl and extracted with 4×100 cc. ethyl ether
Washed with 2×100 cc. H2O
Washings discarded
10. Neutral ether extract evaporated to dryness and taken up in 0.5 cc. glacial acetic acid
Aqueous residue discarded
17. Total phenols
Treated with Girard's reagent T, 100 mg.
Evaporated to dryness, taken up in 50 cc. benzene and extracted with 3×50 cc. 0.3 M Na2CO3
11. Non-ketonic neutral fraction
12. Ketonic neutral fraction
Taken up in ethyl alcohol and subjected to digitonin precipitation
Taken up in ethyl alcohol, 0.1 mg. dehydroisoandrosterone added and subjected to digitonin precipitation
18. Benzene, "weak" phenols
19. Carbonate, "strong" phenols
15. Non-digitonin precipitable, pregnanediol fraction
16. Digitonin precipitate, cholesterol fraction
Evaporated, taken up in glacial acetic acid (0.5 cc.) and treated with 100 mg. Girard's reagent T
Acidified to Congo Red with dilute HCl, extracted with 4×50 cc. ethyl ether
13. Non-digitonin precipitable, α-ketones
14. Digitonin precipitate, β-ketones
20. Non-ketonic estradiol fraction
21. Ketonic, estrone fraction
Aqueous residue discarded
22. Ether extract, estriol fraction

The amounts of reagents indicated are for one liter volumes of urine

a solution is directly proportional to the amount of colored matter dissolved. The color intensity of a solution of hormones of known concentration is compared with that of an unknown, and the results calculated. We usually use a photoelectric colorimeter for such determinations in order to eliminate the factor of human error.

The most fascinating and the very newest research technique is, of

course, that of the use of radioactive tracers. Some beautiful work on thyroid dysfunction has already been done. Practically all of the iodine in the body goes through the thyroid gland, so radioactive iodine can tell us about thyroid function without being messed up in other sorts of metabolism. In steroid hormones, made up only of atoms of carbon, hydrogen and oxygen, I can foresee difficulties in the use of radioactive carbon. How one can tag a carbon atom to make sure it will be used only in the production of, say, estradiol is more than I can see. But undoubtedly some bright boy will have the answer to that question, if it hasn't already been answered.*

And what of the future? With endocrinology, it's really bright. That's more than can be said for some of the other specialties. Surgery, for example, hasn't shown much improvement in the last twenty years. There has been, I admit, some improvement in technique, but the fundamental principles haven't changed. Most of surgery is still apparently based on the idea that if it doesn't work right, cut it out and throw it away.

The discovery of the antibiotics, such as the sulfonamides, penicillin and streptomycin, have simplified the work of the internist.

But in the glorious field of endocrinology we've just barely begun to realize the tremendous possibilities. The next generation or so will, if atomic warfare holds off, see vast steps toward a greater knowledge of what makes our glands tick. I'd like to stick the neck out and make a few predictions.

Most of us who see edocrinologic patients have been impressed with the personality changes which can occur in the presence of various states of glandular imbalance. The menopausal woman, with her estrogen deficiency has a characteristic personality pattern—she's nervous, irritable, moody, forgetful, asocial and finds it extremely difficult to be happy. With estrogen therapy, she can be free from all these unpleasantnesses and can be a happy woman again. Or take the man who is lacking in male hormone; he's indecisive, weak and markedly lacking in aggressiveness. He can be transformed into a real man, with a man's natural drive and pugnacity, by giving him testosterone.

And so I predict that we'll see progress in the treatment of personality disorders by glandular means. It is entirely possible that we will be able to prevent actual psychoses, such as schizophrenia, by proper glandular treatment.

It'll be a great world when endocrinology reaches its peak—no dwarfs, no sterile women, no impotent men, no homosexuals, no insanity and no unhappiness. No fooling!

THE END.

*It has; radioactive testosterone has been prepared at Harvard University. (*Science* 106:248.)

MUTEN

BY DUNCAN H. MUNRO

He was supposed to find and bring into the Board any mutants around. But after talking it over with that particular mutant, he found the orders weren't quite so easy to carry out.

Illustrated by Cartier

Parkinson finished his perusal of the letter, shoved it across the desk toward Yule. "There's another one for you." He lay back in his chair with a malicious smile.

Gloomily, Yule picked up the missive. He had seen that smirk before. Invariably it meant that he was about to chase a distant halfwit. A frown corrugated his forehead as he strove to decipher the letter's spidery scrawl.

Dear sirs:
I have read as how your looking for mutens and I beg to say as how I got a muten right here which same you may inspeck on application.
Yours truly
G. Timberlake (George Timberlake).

"All right," said Parkinson. "What's keeping you?"

"Nothing." Yule got up, mooched reluctantly to the door. "Only sometimes I wonder."

"You wonder what?"

"What I did in my previous life to deserve this."

Parkinson said: "You trod on my neck. Now I'm treading on yours."

Giving him a look, Yule went out. Blondie glanced up from her desk as he passed, her bright eyes curious.

"Off again, Stevie?"

"Yes, worse luck. Everytime somebody thinks a local imbecile might be a mutant off I go again, miles and miles and miles. Then back I come in company with said idiot, miles and miles and miles. By the time I get here I'm half nuts myself."

"Too bad," she sympathized.

"Then they hand my charge over to the experts," Yule continued, bitterly, "who study him until they're cross-eyed. Finally, they decide he's just another daffy. Then they give him back to me and I nursemaid him all the way home, miles and miles and miles." He banged a hand on her desk and shouted, "And Parkinson thinks it's funny."

"I don't," she said. "You need a change."

"Yes, sure, I need a change. That's what I'm going for right now. A change. Another mutant." He pulled his hair forward, contorted his face, let his hands hang like paws. "Thank you, lady, and hurrah. Good-by."

He hurried out. Blondie stared at the wall, slowly shook her head from side to side.

Farmer George Timberlake had sunken eyes, hollow cheeks and huge yellow teeth. He posed suspiciously in his doorway, showed the teeth to his caller.

"My name's Yule, Steven Yule," informed that worthy. "I'm a field investigator from the Board of Social survey. You wrote them saying that you have a mutant." Producing the letter, he showed it to the other.

"Yep." Timberlake's face cracked into a semblance of hospitality. He moved aside, made a gesture. "Come in." Closing the door behind his visitor, he yelled, "Marge, Marge, they bit!"

A plump woman bustled out of the kitchen as Yule seated himself on a hard chair. She eyed him warily.

"They bit," Timberlake repeated. "They sent this gent along." His chest protruded in triumph. "See?"

"What's he giving for it?" Marge asked.

"Ain't ast him yet." He turned to Yule. "What's it worth?"

"Hey?" Steve Yule put his hat in his lap, then on the table, then in his lap again. "Do you mean that you wish to *sell* this mutant?"

"Y'betcha," said Timberlake, emphatically. "That's why I writ in."

"Good grief!" Yule looked prayerfully at the ceiling. "My function is to bring likely specimens in for examination, and afterwards to see them safely home. The Board of Social Survey identifies and prepares comprehensive reports on all cases of genuine mutation. I am not aware that they have ever purchased a mutant or contemplated doing so."

"Does that mean you ain't open to buy?" Timberlake exposed his fangs again. They looked even bigger and yellower.

"I would not go so far as to assert that," Yule assured, hastily. "The question has never arisen until now."

"There's a heck of a note," growled the other to Marge. "They fill the papers with stuff about mutens, say they want 'em real bad, and then won't buy."

"I would have to consult the Board," observed Yule. "Possibly they might like a mutant of their very own." There was a tinge of sarcasm in his voice. "A tame one. Nice to have around."

"Now you're talking." Timberlake pointed to a phone on the wall. "You tell 'em."

Swallowing hard, Yule transferred the hat from his lap to the

table. He approached the phone as if expecting it to bite him.

Hoarsely, he demanded: "Long distance." When Parkinson came on he swallowed again, said: "This is Yule. They want to sell it."

"Sell it?" Parkinson was silent a moment, then, "What for?"

"Money."

"Sell *what?*" roared Parkinson.

"Their mutant."

Parkinson foamed a bit before he asked: "Are you mad?"

"Not yet." Yule gloomed at the wall. "But it won't be long."

The phone started to jump in his hand. He beckoned Timberlake, gave it to him. "You talk. He won't listen to me."

Waiting until the hullabaloo at the other end had subsided, the farmer rumbled stubbornly: "D'you want to buy my muten or not?" He wrestled with the earpiece, held it long enough for Yule to get it back. "Bellering something awful," he complained.

Yule hung the thing down the wall, letting it dangle at the end of its cord. It jerked and twitched as Parkinson's voice ricochetted all over the room.

". . . and furthermore it's illegal for any person or persons to dispose of their offspring for a remuneration, and the purchaser is equally guilty of an offense against the law. Finally, Yule, if that child-trafficking hayseed has filled you so full of overproof tiger's blood that—"

The uproar cut off as Yule racked the earpiece on its prong. Sitting down, he gazed moodily at the others.

"What's all that noisy gab mean?" demanded Timberlake.

"You're not allowed to sell your children. If you do, they'll toss your pants in the clink."

"Who's talking about selling kids?" Timberlake snapped. "You must be nuts."

"Almost," Yule confessed, miserably.

"I writ in offering a muten. You ast for mutens, didn't you? O.K.—what about this one I got?"

"Let's see it," Yule suggested.

"What's the use if you ain't going to make an offer?"

"Let the gent see it," put in Marge. "Maybe he knows somebody else who'd like to buy Endwhistle."

"Endwhistle?" Yule stared around as if seeking a ghost.

"He's the muten," Timberlake informed. "Come on. He's out back."

In single file they crossed the kitchen and the big yard at rear, Timberlake first, then Yule, then Marge. A turkey-cock gobbled at them from a low wall on the right. They entered a big stone barn in which were seven meditative cows and one pensive horse. Timberlake stopped, looked speculatively at the horse.

"What's the matter?" asked Yule. "Is he sick?"

"Yep."

Yule shugged, had a glance around, said: "Where's this mutant?"

"Sick of the place," Timberlake went on, ignoring him in favor of the horse. "Sick of the very home where he was born, the ungrateful dollop of crowbait."

"I get sick of some places myself," Yule observed. "Where's the mutant?"

"Then," continued Timberlake, irefully, "he gets ideas into his head." He turned to Yule, his sunken eyes angry. "And what d'you think he does?"

"I don't know. What does he do?"

"He downs tools and goes on strike. He thinks he's old enough to see the world and too good for honest work. So he strikes."

"After all we done for him," said Marge.

"Just a lousy radical," said Timberlake.

The horse stood and brooded.

"Maybe he's temperamental," Yule suggested. "I'd be temperamental myself if I were a horse." He took another impatient look around the barn. "Where's the mutant?"

"There," declared Timberlake, pointing to the lousy radical. "Endwhistle."

Yule screamed, "What—*that?*"

"Yep. Endwhistle. He's a muten."

Sucking in breath, Yule sat on the rim of a stone trough and eyed Endwhistle's southern aspect. He didn't care for the view. Something about it held a hint of Parkinson's smirk.

"Do you seriously mean to tell me you've brought me more than seven hundred miles to look at a horse?"

"Why not? He's got something, ain't he?"

"Yes," Yule admitted. "I can see that."

"And what he's got is plenty big," Timberlake insisted.

"I can see that, too."

Timberlake followed the line of his fascinated gaze to Endwhistle's drooping tail. "I'll show you something," he promised. Lifting a horny hand, he landed a smack in close proximity of the tail. "C'mon, talk!"

Twisting his head around, Endwhistle curled leathery lips and said: "Foo!"

"There you are, mister." The farmer was openly gratified. "He can speechify. You heard him. He's a muten."

"G'wan, he snorted," Yule contradicted. "I can do that myself." He snorted to prove it.

Marge scowled at him and went to the animal's head. "We want money and you want out. This is your chance as well as ours. C'mon, say something."

"Foo to you, too," said Endwhistle, clearly and distinctly.

Yule fell backward into the trough. Fortunately, it was empty and dry. He lay there for a mo-

ment, his face purple, his legs dangling over the edge.

The horse stared round at him contemptuously and said: "Haw!"

Scrambling agitatedly out of the trough, Yule did a championship sprint across the yard. Timberlake and Marge gaped after him in dull surprise, then followed. He went through the kitchen in a flash, snatched down the phone and gasped: "Gimme long distance again."

The call didn't go through. Dancing with impatience, he glanced at his watch, remembered that the office was closed, put in a second call to Parkinson's private residence.

That one connected all right, and Parkinson come on with a surly, "Well?"

"This is Yule. Listen!"

"Why do I answer a phone if it isn't to listen?" Parkinson inquired, acidly.

"Listen!" Yule yelped. "About this muten, I mean mutant—it's genuine. It's really something. It's fifty karat and diamond-studded in every hole. It's the height of this and that. It's the elephant's bedsocks."

"Yule, are you drunk?"

"I'm drunk with success," he shouted back. "For the first time, I've struck oil. You won't believe it even when you see it."

"I don't doubt that," Parkinson assured. "I've had some of your mutations before."

"I tell you this one's genuine," he bawled.

"That's not for you to say. The experts will be the judges. If your case is not an obvious imbecile, bring him in and let the experts do the rest."

Yule did a jig and howled: "Why d'you think I've called you long distance? *How* am I going to bring him in?"

There was a lengthy silence at the other end, then Parkinson's voice oozed through in slow, measured tones. He spoke as one would to a very young child:

"In one of your pockets you have—or are supposed to have—a block of small forms. They've got *Board of Social Survey* printed on them in big letters. That's so you can recognize them, if you can read. You fill out one of these forms—if you're able to write—and hand it in at the railroad depot. They will provide you with a ticket which is chargeable to us. You use that ticket to bring the mutant here." His voice shot up to an enraged bellow. "You've done it fifty times before—why do I have to explain it *now?*"

"Because," began Yule. He hesitated. He had been about to say, "Because it's a horse." Some imp of perversity made him change his mind, and instead he said, "So it's your official order that I bring him in on one of these forms? In a Pullman?"

"Most certainly." Parkinson became suddenly suspicious, and

added: "Is there any reason why you should not?"

"Only that he's got a tremendously big seat."

"That's nothing. So have African Bushmen. Nature has given them the peculiar ability to store fat in their buttocks, and anyone else who can do it isn't necessarily a mutation." Parkinson sniffed loudly. "A fat guy. Let the railroad authorities worry about him. One man, one ticket. They can't get away from it."

"All right." Yule made to prong the phone.

"And let me see you Friday," Parkinson growled hurriedly. "Not Monday week."

Timberlake raked his teeth with a chip like a tent stake and asked: "Well, think they'll buy?"

"It's likely," Yule hazarded. "D'you mind waiting here a moment? Don't leave the house until I get back." He went out, returned in two minutes, sat down and pondered. After a while, he said, "I got the idea maybe someone was pulling a cheap ventriloquial stunt, so I searched the barn."

"Huh?"

"There was nobody in the place —I made sure of that. Endwhistle invited me to go to hell. He added certain other items suggestive of long service in the marines." He studied Timberlake speculatively. "I can't understand why you've not sold him long before now. Any circus proprietor would swap all his moola and a steam calliope for him."

"I tried." The tent stake cracked, and Timberlake spat a hunk of it across the room. "I writ a dozen guys and tole them as how I got a hoss what could burn their ears off. Only one answered back. He said as how he'd got a giraffe what could play a piano. I don't believe that. It's silly."

"Yes, yes, I guess it is." Yule nodded agreement. "How'd you come by him in the first place?"

"He was born here. I got a small bunch of army rejects from New Mexico. They was cheap."

"No wonder," Marge interjected, sourly. "They didn't last long. Died on us one by one, they did. Something wrong with their blood, the vet said."

"Probably been cropping radioactive pastures," Yule suggested, learnedly. "Go on."

"Endwhistle weren't anything amazing," continued Timberlake, "though he did make plenty of funny noises. He'd whine, yelp and mumble, like no respectable hoss has any right to do. I never took any notice until one day, six or seven weeks ago, when I was cussing him aplenty and all of a sudden he cussed back. He cussed something awful. He's said lots since then."

"But never anything neighborly," added Marge.

"Just a lousy radical," Timberlake repeated.

"He should be worth a good deal

to the right people," pronounced Yule, carefully. "I know the right people. It's mighty lucky for you I came along. Reckon you'd better let me take him away."

Timberlake thought it over, then said: "Nobody's got more dough than Uncle Sam, so you can take him—but not unless you sign for him good and proper."

"I'll sign."

The farmer produced a piece of soiled paper. Yule read it.

"Received from G. Timberlake (George Timberlake): Endwhistle, a hoss what can speechify."

He signed it.

The railroad clerk rasped: "I don't care if the Supreme Court parades before me and certifies that he's entitled to a seat in a passenger coach. I say he travels as livestock, or not at all."

"Why?" Yule inquired.

"Why?" The clerk eyed him incredulously, then exploded, "Because he's an animal."

"That's a heck of a thing to say about someone," Yule reproved. He turned to Endwhistle. "Did you hear that?"

"Yeah." Endwhistle ground his teeth. "The louse."

The clerk's attitude changed instantaneously. Favoring Endwhistle with a look of approval, he spoke to Yule in fraternal tones.

"Pretty good, that. I can do a bit of it myself. Get a load of this." He pointed to a packing case in one corner of his office, screwed his mouth sidewise. A voice in the box called: "Let me out! Let me out!"

"Holy hoofbeats!" exclaimed Endwhistle, his ears flapping. "He's trapped a filly!"

Clumsily leaping the counter, he kicked the case to pieces. Six sewing machines fell out. The clerk covered his eyes with his hands as Endwhistle stomped furiously around and invented several new words.

"Serves you right," said Yule, severely, "for not tending to your business. Now does he get his ticket, or doesn't he?"

"He doesn't." Uncovering his eyes, the clerk watched Endwhistle warily. "And it's going to take me an hour to nail up that case." Admiration overcame indignation, and he ended with: "But I sure give in to you on this voice-tossing play. You're better than Bergen."

"I tell you I didn't do it. He did it himself. He can talk, you nitwit."

"Ha-ha," said the clerk, respectfully.

"Look." Yule protruded his lips Ubangi-fashion. "Get hold of these." Obediently, the clerk got hold.

Yule waved at Endwhistle. Surveying him with deep interest, Endwhistle waved his tail. A cop entered the office, flinched at the sight of a horse on the wrong side of the counter, gaped at the clerk still clinging to Yule's lips. He took off his cap, wiped his eyes with a handkerchief, had another look.

Pulling the other's hand away from his lips, Yule said: "Darn it, I wanted to tell him to talk."

"Fancy that," the cop chipped in. "How could you with a guy swinging on your gob?"

"You keep outta this," warned Endwhistle.

The cop stared vaguely around, employed the handkerchief again, and demanded: "Who's being funny?"

"This guy," said the clerk, generously. "He's good."

Yule yelled: "It isn't *me*." He pointed a dramatic finger at Endwhistle. "It's *him*."

"It is he," corrected the clerk.

"Nuts!" growled the cop.

Yule played Ubangi again. The clerk gripped his lips. Yule made frantic signals at Endwhistle.

Endwhistle obliged with a disgusted, "Aw, quit the manplay."

"Hey-hey," commented the cop, transferring his attention from Yule to the clerk. "Jake's at it again."

Letting go the lips, and getting as far from Endwhistle as possible, the clerk protested: "I didn't do it, Eddie. Honest to Pete, I didn't."

"Of course you didn't, Jake." The cop smiled nastily, and came forward. "You button this guy's trap while I fasten *your* chops—*then* we'll know who's doing it."

"Meaning it'll be you," suggested Yule, maliciously.

"Me?" The cop was indignant. "I'm no vaudeville artist."

"We've only your word for that," pursued Yule, determined to fight fire with fire.

"What about giving him a handhold on your own pan, Eddie?" said the clerk, with a flash of genius.

"O.K." The cop protruded his lips. They stuck out like pink tires.

All three took a firm grip on each other's kissers and waited for Endwhistle to give forth.

The mayor, the fire chief and two henchmen chose this moment to walk in upon the intriguing scene. They stopped in midstep, simultaneously, like men who'd run into an invisible wall.

Taking off his hat, the mayor fanned his fat chops with it, put it back on his head and breathed, "Holy mackerel!"

Releasing the clerk's pouter as if it were red-hot, the cop started beating urgently at Yule's hand stubbornly fastened on his own masticator. He made an angry *mmm-m-m* sound resembling that of an oversized and irritated bee. Yule hung grimly on, stretching the tires somewhat in the process. The cop showed signs of becoming savage.

"Smell their breaths, Hank," suggested the mayor to the fire chief.

With a frantic effort the cop pulled free of Yule's grip, spluttered, rubbed his lips with the back of a hairy hand. He pointed the hand accusingly at Yule.

"I'm gonna pinch that mug," he yelled.

Ungagging himself from the clerk, Yule inquired, "On what charge?"

"Horse-stealing," suggested Endwhistle, usefully.

"See? Hear that?" The cop was triumphant. "He's tossing his voice into that bangtail."

"So what?" demanded the fire chief, admiring Yule. "That's no crime."

"It was Jake, anyway," offered Yule, suddenly changing tactics.

The clerk backed away fast, waving protesting hands. "So help me, it wasn't. I didn't open—"

"I wouldn't be surprised," said the mayor, viewing Jake with some disfavor. "You put on a good turn at the last town concert. Maybe success has gone to your head, eh? You think you're too good for the job you've got, eh?"

"That's telling him, Fatso," put in Endwhistle with unnecessary heartiness.

A faint tinge of purple bloomed on the mayor's plump features. Switching his glare from Jake to Yule, he growled, "That wasn't Jake. He just wouldn't dare—would you, Jake?"

"Not on your life," agreed Jake, fervently.

"So you're the smart-Aleck, eh?" The mayor moved forward until his paunch was almost in contact with his listener. "What's the big idea?" He glowered at Yule.

"Look," said Yule, "all I want is a coach reservation for that bronc. I came here to get it for him—and the trouble started."

"I should think so, too," said the mayor.

"He's got government authority," Yule shouted.

"And how!" added Endwhistle, smacking his lips.

The mayor's scowl grew deeper. "You can sling your voice halfway from here to Mex and it still wouldn't impress me. Let's see that authority."

Yule showed it to him.

"Who issued this?"

"Parkinson of Social Survey."

"O.K.," said the mayor, ominously. "We'll see." Leaning to one side, he got the phone in his fat hands, put through a call, adding, "Reverse the charge." After a while, he asked, "That Parkinson?"

Parkinson admitted it surlily.

"This is William B. Lucas, mayor of Reedsville."

"How do I know that?" asked Parkinson.

"Because I'm telling you," said the mayor, his voice rising.

"Don't raise your tones to me," Parkinson shot back. "I'm not deaf."

"Merely dumb," commented Endwhistle.

Hearing it, Parkinson howled: "Who's the smartie?"

With a do-or-die look in his eyes, the mayor desperately coddled the phone and howled back: "Did you or did you not authorize a Pullman reservation from here to New York—for a horse?"

"For a horse?" Parkinson's voice faded as he turned and spoke to someone else at the other end. "Some crackpot asking about a reservation for a horse. We're paying for the call. I've half a mind to trace it and—"

Slamming the phone down, the mayor turned slowly. He spoke with suppressed emotion. "Eddie, take

this hobo and his nag to the town limits." His burning gaze moved to the henchmen. "You two go with Eddie." The gaze transferred to Yule, "By all the saints in the calendar, if I set eyes on you again I'll pin you down with fourteen charges."

"Tut!" reproved Endwhistle.

"Get out!" bellowed the mayor, showing signs of mind at the end of its tether.

It was three dreary days before they hit another town of any size. Endwhistle plodded lugubriously into the area of bright lights, Yule sitting sore-seated on his back. They stopped as traffic lights turned red. On their left stood a bar, warm, brightly illuminated, inviting. Yule eyed it longingly, eyed it again, dismounted and made the sidewalk just as the lights turned green.

"To blazes with Parky, the Social Survey and the world in general. I'm going to have a drink before I collapse."

"A drink," approved Endwhistle, following. "I could soak up a river."

They went through the swing doors. A huge bodied, pug-faced bartender was leaning over the bar talking to the solitary customer. The latter, a white-haired, racily-dressed individual, sported a big black cravat ornamented with a whip-and-stirrup gold pin. Casually, the barkeep noted Yule's entrance out of one corner of his eye. He straightened abruptly as Endwhistle ambled through.

"That your hoss, mister?"

"No." Yule seated himself at the bar, moistened dry lips in anticipation. "I'm merely in charge of him. He's Uncle Sam's. If you don't like him, take the matter up with Unc."

"Out he goes," said the barkeep, flatly.

The customer with the pin turned a florid face on Endwhistle, got him into focus, registered mild pleasure and said to the bartender. "That's ungenerous of you, Pat. Where's your Irish hospitality?"

"No hosses allowed," asserted Pat.

"Who says so?" asked Yule.

"*I* say so," said Pat, thrusting his face close to Yule's.

"Who're you?" inquired Endwhistle.

Pat dropped his wiping cloth, picked it up dreamily.

"There's nothing in the city ordinances against equine characters in bars," said the customer with the pin. "Especially conversational ones." He bowed toward Endwhistle with inebriated lack of grace. "I, too, have horses that nearly talk; but none so vocal as you. My name is Grindlesby. Would you care to have a beer with me?"

"What's beer?" demanded Endwhistle suspiciously. He sat down on the floor, his head high above the bar.

Yule told him what beer was.

"I'll try it," Endwhistle decided.

"Can't be any worse than Timberlake's muddy water."

"Bring him a bucketful," ordered Grindlesby. He watched as Pat resignedly got out a stub of pencil and a piece of paper, helpfully added, "Two gallons to the bucket, eight pints to the gallon—three bucks twenty." He slipped it across.

Ringing it up, Pat brought a bucket, filled it, heaved it into position. Endwhistle shoved his muzzle into it, investigated it, sucked noisily.

"Nice?" inquired the donor.

Pulling out a sud-covered nose, Endwhistle said: "Wunnerful! This is mighty chestnut of you."

Grindlesby was gratified. "Like another?"

"One's plenty for him," Yule put in quickly. He changed his aim to Pat. "Now how about bringing me—"

"Is this any business of yours?" demanded Grindlesby, bridling. "If he wants another, I buy him another, see?" He teetered on his seat as he extracted his wad. "Fill the bucket, Pat."

Frowning heavily, Pat pumped at the bucket until it foamed. Yule sat and held his head between his hands while Endwhistle made loud slobbering sounds. Yule had apprehensions about the shape of things to come. He shuddered as Endwhistle suddenly belched with gusto that showered suds over Pat.

Noting Yule's attitude, Endwhistle demanded "What's eating you?"

"Shut up!" Yule snarled.

Endwhistle appealed to Grindlesby. "There's gratitude for you. I lug him on my aching back for three solid days—and now he's jealous because I've had more beer than him."

"Dishgraceful." Grindlesby bleared at Yule reprovingly. "Dishgraceful." Extracting his wallet, he peeled four off the wad, pushed them at Pat. "Fill the bucket."

"Don't," ordered Yule.

"Fill the bucket," rasped Grindlesby.

"Now look here—" began Pat, glaring from one to the other.

"Fill it!" Endwhistle snorted. He half arose, planting his hoofs on the bar, his eyes rolling.

Pat pumped furiously.

Squatting back, Endwhistle sucked with eager noises. "And Timberlake always gave me water. I worked for him until I dropped—and he gave me water."

Yule said nothing.

"Just water," complained Endwhistle, glooming around. He burped, meditated, and finished: "The bum."

"Definitely a poor sport, sir," agreed Grindlesby. "I wouldn't treat a dog like that."

Endwhistle had a long, deep suck at the bucket, then thought awhile. The last words came to him with delayed action. He perked up, stared around belligerently, and asked: "Who's calling me a dog?"

"He did," informed Yule maliciously. He pointed at Pat.

Hoofs clattering in the confined space, Endwhistle heaved himself up. "Just for that—"

"Dishgraceful," put in Grindlesby, swigging half a glass and mopping his mouth with a large polka-dot handkerchief.

Ducking down and moving swiftly to one side, Pat protested, "He's a liar." His small, deep-set eyes held the hunted look of a man having nightmares wide awake.

"Did *you* call me a dog?" demanded Endwhistle of Yule. He sneezed, blowing suds off his mustache.

"Certainly not. I wouldn't be so vulgar."

"Maybe I'm not hearing right." He mooned at the bucket. His tail gave a couple of spasmodic jerks. "This stuff sure does make me feel funny."

Yule sighed. "You're drunk. Just a four-legged sot. What'll Parkinson say?"

"Is thish Parkinshon his owner?" inquired Grindlesby, with skidding tongue. "If so, begad, I reckon I could do a deal with him. I've a proposition that—"

"Nobody owns me," interjected Endwhistle, full of the dignity of beer. "Nobody, see?" He flapped his ears at Pat.

Pat backed off and growled: "That's what you think. You got it coming to you." He favored Yule with an ugly look. "Better get this guzzler outta here before my patience goes west."

Finishing his drink, Grindlesby slid off his stool, teetered, then hammered the bar with a skinny fist. "He who inshults my friends inshults me."

"Thanks," approved Endwhistle, gratified.

"Nuts!" said Yule.

Pat went determinedly to the farther end. "You're all plain daffy—and I'm gonna do something about it." He helped himself to the telephone. "Gimme police." He hung on a moment, the others watching with aloof interest. His heavy eyebrows began to work up and down as he spoke into the instrument with a note of appeal. "Look, sarge, this is Pat Hogan. I got trouble. I got two drunks and a talking horse in my bar and—" He paused, said, "Eh?" then beckoned to Endwhistle. "He wants to speak to you."

"Me?" Endwhistle registered intense surprise. Getting off his rear, he went to the phone, held his head near the earpiece.

A voice asked: "Are you a horse?"

"Y'betcha!" Endwhistle assured.

"Watcha been drinking?"

"Beer," said Endwhistle with undisguised pleasure.

The voice spoke in a dimly heard aside to someone else at the other end. "Pat's spiking it again. A guy there thinks he's a horse."

"So I am," insisted Endwhistle.

"Yes, yes, we know," soothed the voice in louder tone, then lowered again as it continued its remarks. "The joint'll be a zoo before midnight, if I know Hogan. Better get the boys to look in." Louder again. "Tell Pat we're coming round."

"They're coming round," Endwhistle informed the audience.

Yule promptly walked to the door. "You know what that means? They'll take you straight back to Timberlake. They'll tell him to fence you in. No more freedom. No more beer. No more anything." He bowed his head in grief. "Such a loss."

Eyes rolling, Endwhistle reared up, came down with a clatter that shook a bottle off a shelf. He snapped at Pat: "Why, you dirty two-timer."

"But there's still hope if you get out fast," suggested Yule from the door. "Ten seconds will make you too late." He jumped aside as Endwhistle went through the doors with a distinct zip.

The mutant didn't stop. With ears and tail streaming in the wind he went up the street all set for the mile record. Picking up his feet, Yule began a hot but hopeless chase.

Behind them, Grindlesby emerged uncertainly from the bar, focused his eyes with an effort, took in the escapees, signaled a taxi.

"Get ahead of that mushtang. Can't afford to lose him—he's the shtar of my shtud." He flopped back in his seat as the taxi jerked forward. "Fifty bucks if you make it." Idly, his hand fumbled with his whip-and-stirrup pin.

Ominously, Parkinson did not utter a word until Yule had finished. With his cold optics fixed firmly and penetratingly on the other, as unblinking as a snake's, he sat solidly behind his desk and timed the speech with taps of a silver pencil.

"Then," Yule continued, "this thieving punk Grindlesby sobers up enough to use what's left of his wits. He figures that a horse that can talk to people can also talk to other horses, and that there's a mint of money in it for someone—especially if the ability to gab breeds true. So he gets Endwhistle an hour ahead of me, bribes him into playing it his way and wires Timberlake an offer. Timberlake sells him right out of my hands." He made a defeated gesture. "After that, it needs six telephone calls and four cops to get them this far—with Grindlesby threatening a lawsuit all the way."

"And how," inquired Parkinson, with pretended curiosity, "does one bribe a horse?"

"I told you." Yule's voice went up, began to get squeaky. "Grindlesby runs a stud. He showed Endwhistle photographs of it, invited him in on the ground floor. Endwhistle yelps, 'Wow-hoo!' and falls for the bait. If you were a horse, what would *you do?*"

Parkinson was taken aback. "Huh?"

"Snappy pics of forty fillies," said Yule, bitterly.

"An elegant speech," commented Parkinson distastefully. His gaze found the calendar. "A fortnight. You've had a fortnight's vacation, got stinko every day as far as I can make out. You've billed me long-distance calls and, finally, you come back with this cock-and-bull story."

"So help me—"

"Not satisfied with which, you return accompanied by a dopey looking nag and an aged tosspot who wants to sue everyone in sight."

"Let him sue. Endwhistle's worth a million."

"He looks it," said Parkinson sarcastically. He lifted the phone on his desk and asked, "Well? Any luck?" The phone yapped back at him. "I thought as much," he said, and cradled it. His stare returned to Yule. "Not a word. Not a syllable. Not even one honest oath. We were nuts to expect it." He resumed his pencil-tapping. "Thanks to you we've had to release him to this Grindlesby with our abject apologies." He spoke a little louder. "I don't like making apologies." He paused, then bellowed, "I don't like making abject ones."

Yule started to dance to and fro. "I tell you he's been tipped to clam up. He won't talk in case his big fat trap keeps him out of the harem."

Parkinson retorted: "I'm going to give you a last chance—why, I don't know. I must be weak."

"Mother of Mike, there's the chance of a lifetime slipping right out of your—"

"Shut up!" Parkinson opened a drawer, found a letter. It was pale pink, had deckled edges, smelled faintly of rose water. "If you make a mess of *this* one, you'll soon be peddling gimmicks on the curb." The ire drifted out of his face as the old, familiar smirk came into it. "This is from a maiden lady in Topeka. She thinks the folk next door are harboring a mutant. Get out there and see—"

Yule snatched it savagely out of his hands, went to the window and brooded. After a while, Grindlesby passed with Endwhistle following.

Opening the window, Yule said to Endwhistle, "Just a dumb animal!" He added a rude noise.

Stopping, Endwhistle curled back his lips and said with maddening distinctness, "Wow-hoo!" Then he winked and plodded on.

Yule left the window, found a chair, sat down and watched with extreme pleasure as Parkinson reacted. Parkinson stood up, beat his head against the wall, and went out fast.

In the outer office, Blondie's voice sounded sympathetically: "Off again Stevie?" then, "Oh, it's *you*, Mr. Parkinson."

Moving over to Parkinson's chair, Yule tried it for size.

THE END.

BOOK REVIEW

"Triplanetary" by Edward E. Smith, Ph.D. Fantasy Press, Reading, Pa. 1948. $3.00

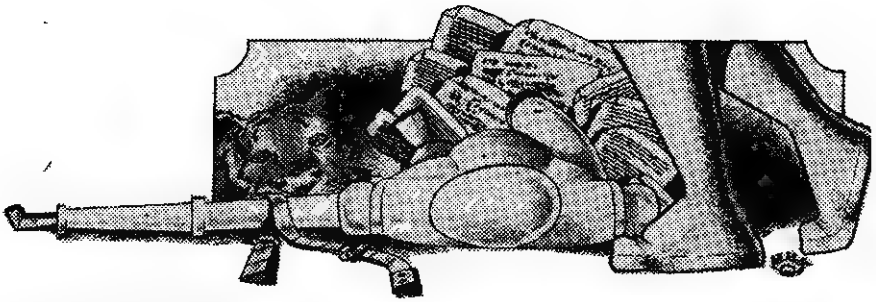
Dr. Smith should never take offense when he is called the father of the space-opera. Just as in grand opera everything is done on a grander, more sweeping scale than on the ordinary stage, so in a Smith epic the people and events move in a way and on a scale all their own. Vastest of all his projects has been the Lensman series in which little by little the age-old struggle between the antithetical cultures of Arisia and Eddore was revealed through and behind the growth of a galactic civilization of human and nonhuman races working for a common end.

Ostensibly the Lensman series began in this magazine with "Galactic Patrol." Now, however, "Triplanetary" is revealed as the true opening chapter in the saga of the Lens and of Civilization. An introduction of nearly one hundred pages traces the Arisia-Eddore conflict from its beginning to our immediate future. The ancestral Kinnisons appear—in ancient Atlantis, in the world wars of our own time, and commanding the armed forces of the Triplanetary league.

The original story, extensively lengthened and rewritten to tie it firmly into the framework of the Lensman series, described the struggle of Virgil Samms and his colleagues of the Triplanetary Service with Grey Roger and his space pirates, and with the invading alien culture of the iron-hungry amphibians of Nevia. So far as the reader is concerned, the Arisian and Eddorean forces are brought into the open, but it can be seen that whether Dr. Smith originally planned "Triplanetary" as a unit in the series or not, the basic pattern of the later stories was there. The working team of experts foreshadows the fusions of the Arisians; Virgil Samms' network of operatives with their self-identifying meteor pins is an elementary form of the brotherhood of the Lens. Finally, Arisia's existence is at last revealed to the Eddoreans, the evil subsurface empire of Boskone is founded, and a treaty between the Nevians and Mankind ushers in the counter-empire of galactic Civilization.

A. J. Donnell's vignettes for the chapter headings are as effective as they were in "Spacehounds." "First Lensman," an entirely new story which will link "Triplanetary" with "Galactic Patrol" through the person of Virgil Samms, first wearer of the Lens, is promised for 1949. Fantasy Press is bringing us, in permanent form, an epic which has no parallel in science fiction.

P. Schuyler Miller



TIGER RIDE

BY JAMES BLISH AND DAMON KNIGHT

"Came back from the ride, with the lady inside"—and such a helpful, a too, too helpful robot tiger!

Illustrated by Skollar

2/4/2121

Tested the levitator units this morning. Both performed well with the dummies, and Laura insisted on trying one herself—they were tuned to her voice, anyhow. Chapelin objected, of course, but his wife overrode him as usual. I believe she was actually hoping there would be an accident.

Laura Peel said: "Just the same, I'm going to do it."

The wind was in her fair hair and pressing her clothes gently against the length of her slim body. She looked uncommonly beautiful, Hal Osborn thought. He wondered, what the devil does Chapelin see when he looks at her?

Chapelin's big blond face was a study in prudence and responsibility. He said: "Now, let's not be unreasonable, Laura—"

Niki Chapelin's voice cut him off. "Oh, why not let her? It's perfectly safe, isn't it, Hal?"

"Nope," said Hal. If anything did happen, he thought, all she'd have to do would be to remind everybody, "But Hal said—"

Her small mask turned toward him, and the basilisk eyes drilled holes in his forehead. He felt again the rising urge toward murder which often shook him these days; the isolation was beginning to tell on them all, and sometimes Hal thought he would abandon Laura and ultronics and all the rest for a

chance to leave this God-forsaken tomb of a planet.

No, he corrected himself, not a tomb; a ghost, and the brother of a ghost. Styrtis Delta III was the satellite of a huge planet, which in turn swung around a Gray Ghost—a star so huge and rarefied that it gave no light. Luckily there was a yellow companion star which provided almost-normal days for half the year; the nights, rendered deep, livid blue-green by the reflection from the methane-swathed giant planet, were not normal, but they were bearable.

And the whole complicated system was in a corner of the galaxy where no possible explosion, no matter how titanic, could injure the works of man—in a limb of stars which man had never before visited, and had scarcely mapped. The Earth Council had awarded this planet to the ultronics group, and given them the period of "summer" at Council expense to work out their discoveries. When the yellow sun was eclipsed by the Gray Ghost, Styrtis Delta III would have a winter that might have made even Dante tremble.

The people who had once inhabited this planet must have been unique; the seasonal changes they had had to withstand were terrific. Whatever had killed them off, it hadn't been the weather, for the ruins of their cities still showed the open spaces and wide-spanned architecture of a race as used to storm as to quiet. Maybe they'd killed each other off; storms of emotion could destroy things untouchable by Nature.

Luckily, Niki could spare Hal only the one look. Chapelin was beginning to repeat all his arguments to her, and she had to turn on her heavy artillery: Mark IX, the look of bored impatience.

The levitator was an entirely new device, said Chapelin, it was new even in the hundred-kilo lab stage, let alone belt-size. It wasn't just the danger of falling, he said, there was a thing made of platinum called a governor that was only three mm long, and if that went, Laura could find herself digging a hole in the ground with two Gs behind her. There were good reasons for never testing a new ultronic device in person before it had had at least fifty hours' run on the dummies—dummies don't experiment with unfamiliar equipment, they don't move of their own accord in flight and disarrange things, they don't miscalculate and release the total ultimate energy that could consume a whole group of suns.

Niki was swinging her riding crop against her skinny tailored thigh. She had come because she was Chapelin's wife, and because Laura was coming. Ultronics interested her mildly, sometimes.

Hal stole a glance at Laura. On the other side of her, little Mike Cohen was chewing his pipe, watching and saying nothing. Hal met his speculative gaze, and looked away guiltily. Laura's mouth had

had that hurt, childish down-curve, the same as it always had when she was watching Chapelin unseen. Her spine was as straight as ever, though. She's licked, he thought, she always gets licked. She'll go through with it out of sheer defiance.

A star-shaped shadow passed slowly between Hal and the Chapelins. He looked up.

"Wind's blowing them toward the edge of the plateau," he said. "Better pull 'em back."

Everybody looked. High over their heads, the two seven-foot mannikins were canted slightly, their blank heads pointed toward the distant Killhope range. "Wind's pretty strong up there," Chapelin said uncomfortably. "You might as well bring them down, Laura."

Niki said: *"That's* better, dear. You're so much nicer when you're not stubborn."

Chapelin turned back to her. "Wait a minute," he said, "I didn't mean—"

"I'm going to do it anyhow," Laura said clearly, "whether you let me or not." Her lips compressed. She watched the dummies and said: "Right. Right— Enough. Down."

"Well," Chapelin said, "be careful."

Hal felt the surge of hatred again. Chapelin, can't you see she loves you? Won't you put up any kind of a fight, make her see that you're worried about her? If you'd show the slightest interest, you could persuade her not to try it—

The dummies floated down until the tips of their legs touched the ground. They hung there, swaying gently. Laura said: "Stop," and they sat down abruptly as if their strings had been cut, then flopped over and lay sprawled on the sun-caked turf.

Chapelin had drawn his wife a couple of meters away and was talking to her earnestly. Niki was listening to him with no sign of impatience, which meant that she was amused.

Hal choked and walked over to the dummies. Laura was kneeling beside one of them, taking off its belt. She got up as he approached, her bare knees dusty.

"Let's have a look at it," Hal said. "That landing was a little rough."

She put the articulated silver band around her waist, leaving the one she'd been wearing on the ground. "Let me alone just now, Hal," she said in a barely audible voice. She stepped away and said: "Up."

The belt took her up.

Hal watched her go, squinting his eyes against the lemon-yellow sky. She went straight up, with a halo of saffron light on the top of her blond head, and stayed there until he was beginning to wonder if she was ever coming down again. Then she dropped swiftly, turned, and swooped over their heads.

Hal swore. Laura didn't know what "careful" meant. He was angry at himself for failing to try to

stop her, and angry at her for taking out her feelings about Chapelin on them all. If that governor cut out, they might all die—the whole crazy solar system, the whole ridge of stars could be annihilated under certain conditions.

She was up high again now, so high she could barely be seen. Despite the hot sun on the plateau, it was cold that high up, cold and blustery with the ceaseless blast of this planet's rapid revolution. Then she began to drop again, faster than she should, as if under power.

At the lip of the plateau, Laura seemed to see that she was going to miss it, and reversed the controls. The belt jerked her slantwise back toward them, and burned out in a flare of copper-colored energy. Everyone but Hal hit the ground and waited for the world to end.

Hal stayed on his feet, his mind a well of horror. Laura's body tumbled over their heads and struck just beyond them.

Then everyone was running.

Oh, yes; we buried old Jonas today. He was a quiet, pathetic little guy, but he wanted to go home like the rest of us; I wish we could have had his body shipped back, but twenty-five thousand volts doesn't leave much to ship. Besides, the accident with Laura rather took our minds off him.

In the shack Hal shifted his weight uncomfortably on a drum. Mike Cohen was talking quietly, but Hal only half heard him. Laura lay on one of the cots, seemingly without a single bruise; but she was not breathing. Chapelin sat beside her, wringing his hands in a blind, stupid way. Niki had the good sense to be absent, out in the generator shed, congratulating herself, Hal supposed.

"I still think she's alive," Mike Cohen went on. "We know so little about ultronics—every accident's a freak at this stage."

Hal stirred. "The belt wasn't hurt," he said numbly. "At first I thought it'd sliced her right in two." He looked at the gleaming, jointed thing, still clasping Laura's waist. They had been afraid to touch it—if there were still a residue of energy in there, and the governor gone—

"That's right. And the fall should have broken all her bones. She hit hard. But . . . I don't think she really hit at all. Something took up the shock."

"What, then?"

A strangled sound came from the cot. Hal started and stood up, his heart thudding under his breastbone. The sound, however, had come from Chapelin, who was also standing, bending over Laura.

"Chapelin? What is it?"

"She's breathing. She started, all of a sudden. I—" His voice broke, and he stood silent, hands working at his sides.

But it was true. Laura's breast was rising and falling regularly,

naturally. There was still no color in her face.

Even as Hal noted that, a faint tinge of pink crept in over her cheekbones.

"Thank God," Chapelin muttered. "She's coming around." He looked at Hal and at Mike Cohen, meeting their eyes for the first time since the accident. "It was funny. I heard a sort of sigh, and when I looked, she was breathing just as if she'd been asleep. Shall we try to get the belt off now?"

"I don't think we should," Mike said. "It may still be in operation, and it's tuned to her. Best wait 'til she tells it to turn off."

"How do you know it's still on?"

"It must be. That flash of copper light—it was only an electrical short, or we'd none of us be here now. We've never been able to overload an ultronic field before, and *something* must have shielded her during that fall."

On the cot, Laura whispered, quite clearly: "Is that you, Mike? Where are you? I can't see you."

Chapelin bent over her. "Laura," he said huskily. "How do you feel? Can you move a little?"

"I'm all right, but it seems so dark. I can just barely make you out."

Mike Cohen chuckled, a small, joyous sound. "You're O.K., Laura. We were too busy to remember about such little things as sunset." He trotted quickly across the room and turned on the lights. Laura sat up in the fluorescent glow and blinked at them.

For a moment no one could speak. Then, from the doorway, Niki Chapelin's voice said: "Why darling! What a *relief!*"

2/5/2121

Laura's not hurt, but naturally somewhat shocked emotionally. We were all anxious to look at the innards of the belt, but she won't give it up; claims that it saved her life now and that it goes with her uniform. It is decorative, at that.

It was very quiet in the little laboratory; only the sound of Hal's breathing and the minute-ticking of the device upon which he was working broke the stillness. Outside the window, a silent landscape lay bathed in deep blue-green, like a vision of the bottom of a sea.

There was a modest knock on the door, and a dial on the table moved slightly. That, Hal, knew, would be Laura; no one else would be carrying or wearing anything which would disturb an ultrometer, especially not at this hour. If only she'd surrender that belt! He wondered what she wanted of him.

The knock sounded again. "Come in," Hal said. The girl slipped past the door and closed it carefully.

"Hello, Hal."

"Hi. What can I do for you?"

"I got to feeling a little depressed and wanted company. Do you mind?"

"Chapelin's still up, I saw the

light in the shack," Hal said sullenly. The next instant he could have bitten off his tongue; but Laura did not seem to react at all.

"No, I wanted to talk to you. What are you doing?"

He said wonderingly: "The same as always—trying to get enough of a grip on the ultronic flow to disrupt it. The little ticker here records the energy flux. If I can cause it to miss a beat now and then, I'll know I've managed to interfere. So far, no soap; we can direct the flow, but not modify it."

"Watch the blast limit."

Hal shrugged. That was the problem, of course. This energy was strictly sub-subatomic; somewhere nearby there was a nexus where the fields met, a nexus where cosmic rays were created, out of some ground energy called ultronic as a handy label. Chapelin thought there must be billions of such nexi in every galaxy, but they had been indetectable by their very nature until just recently. The Earth Council had been scared to death when Chapelin had reported the results of

his first investigations, and had quarantined the whole group. Unless they could learn how to modify the forces involved—

"We've done well so far, all things considered," Hal said. "The moment we do badly, it'll be all up for us, and this whole corner of the universe."

Laura nodded seriously. Hal looked at her. As always, her loveliness hurt him, made it difficult for him to concentrate on what he was saying.

"But you didn't come here to talk ultronics, surely. Isn't there—"

She smiled, a little wistfully. "I don't care what we talk about, Hal. That accident—you don't go through a thing like that without being forced to think about things. I remembered your asking to see the belt before I went up, and how you tried to look out for me, and a lot of things you've done for me—and I knew all of a sudden that I owed you a lot more than I'd been ready to admit."

Hal made an awkward gesture. "It's nothing, Laura. I've made no secret of how I feel. If you don't share the feeling, those little attentions can become a nuisance, I know."

"That's true," Laura said. "And I realize now how careful you were not to . . . to force anything on me. Not everybody would be that considerate, so many parsecs from any sort of civilization. It's given me a chance to find out how I really do feel—that, and the accident."

Hal felt his heart begin to thunder against his ribs, but he kept seated by sheer will-power. "Laura," he said, "please don't feel that you have to commit yourself. It's really the parsecs that count the most. When six people—five, now—are marooned, in close quarters, for so long, all kinds of unnatural emotional tensions develop. It's best not to add to them if there's any way to avoid it."

Laura nodded. "I know. But most of the tensions that are already here are my fault. Oh, don't deny it, it's true. Niki wouldn't be here if it weren't for me, and the way I felt about Chapelin. I've been a useful lab technie, but emotionally I've always been in the way. It's different now. Chapelin—he's a sort of timid moose, isn't he? I've been pretty blind. I flatter myself that I can see, now." She toyed with an amber-handled, tiny screw driver on the workbench. "That's—why I'm here."

The blood roared in Hal's temples. He said: "Laura—"

After that it was very quiet in the little shack.

2/8/2121

The Council survey ship came by yesterday, and we had a good report to make; if they could have landed, we'd have been able to show them things that would have made their eyes bug. But they weren't going through our area, and only inquired in a routine way; Earth's still scared green of ultronics. One

funny business: when I reported Jonas's death—expecting all kinds of hows and whens and whys—the Ship's Recorder didn't seem to know what I was talking about. "Jonas who?" he said. "Did you have a stowaway?" Evidently Earth has already forgotten us, and can't be bothered over whether there were five or six or thirteen in the group.

For a while things seemed to go along well enough; but Hal could not rid himself of the sensation that somewhere there was something radically wrong, if only he could find it. Oh, there was Chapelin to account for some of it. The accident, for which he could not help but hold himself responsible, seemed to have jarred some long-dormant cells to activity in Chapelin's mind. For the first time he seemed to be looking at Laura as something besides a competent laboratory assistant. They were all aware of it, Niki most of all, of course—for Niki had suspected it even when it didn't exist—but it was marked enough to worry even Mike Cohen.

That caused tension, but it was the old, familiar kind of tension. This other thing was—strange. Hal couldn't pin it down; it was a general uneasiness, strongest when he saw the belt gleaming enigmatically about Laura's slim waist, and when he reviewed certain entries in his journal. It was as if he were awaiting some disaster he could not describe, and it kept him up late every night, crouched over the ticking little modulator.

Even there, he had enough success to make him hopeful; within three nights he was able to modulate the steady ultronic flow, and on the fourth night he discovered, all at once, a chain of improbable formulae describing the phenomenon—a chain which showed him that his next step would have triggered the blast whose echoes they all heard in nightmares.

It was as if there was a silent conspiracy afoot, a conspiracy to convince Hal that Everything was going to be All Right. He looked at the equations again; they were new, a brand of math he seemingly had invented on the spot—and he had "discovered" them about ten minutes before he would have set off an interstellar catastrophe.

There was one kind of math Hal knew as well as he knew his own name: permutations and combinations. A few sheets of paper later, he had worked out the chances against his making this particular discovery at this particular time. The result: 3×10^{18}. Such coincidences *did* occur, but—

He shut off the detectors, and discovered that his hand was shaking a little. If only he could pin down this irrational dread! Well, if he were that unsteady, he'd better cut the generator that fed his lab, or there'd really be a blow-up, miracle or no miracle. He stood up, stretching cramped muscles.

The modulator glimmered up at him from the bench. He put it in his pocket and went out into the green gloom.

The spongy, elaborately-branched moss effectively silenced his footsteps. When he jerked open the door of the generator shed, Chapelin and Laura were still locked together.

Hal gagged and tried to step out again, but they had heard the door open. Chapelin broke away, his big face turning the color of old turnips in the greenish light. Laura did not blush, but she looked—miserable.

"Sorry," Hal said, his voice as harsh as a rasp. "However, as long as I'm here—"

He strode past them and yanked the big switch from its blades. Laura said: "Hal . . . it isn't quite what—"

He spun on her. "Oh, it isn't, eh?" he said grimly. "I suppose Everything Is Really All Right?"

"Now, wait a minute," Chapelin blurted. "I don't know what right you have to be taking that tone—"

"Of course you don't. Probably Laura just said she's been thinking and wanted to talk to somebody—or don't you use the same line on us all, Laura?"

Laura raised her hand as if to ward off a blow. Inside Hal's chest a rusty can opener ripped at his heart. He said: "You're on the spot now, Laura. You can be all things to all men if you try, but not to more than one man at a time! Your story can satisfy either Chapelin or me—but not both of us at once. Want to try?"

Laura's lips thinned a little. "I don't think I'll bother," she said, walking toward the door. "I don't like taking orders."

Hal caught her wrist and forced her back against the now-silent generator. "Clever," he said, "I forgot the outraged-virtue act; it's good—almost good enough. But it won't work with me, Laura. I think I know the story now."

"What's going on here?" Mike Cohen's voice said from the doorway, "If you'd open a window, they could hear you all the way back on Earth."

"Hello, Mike," Hal said, without turning. "Stick around. I'm either making an ass of myself or staging a showdown, one or the other. Niki with you?"

"Naturally," Niki's voice said. The cold fury in it was appalling; Niki did not yet know what had happened, but in any such situation she had only one guess to make.

"What's the story?" Mike said.

"You know most of it. The crux of it is that belt of Laura's. It's still in operation, we know that; and I think it's somehow invaded her mind. The way she's been acting since the accident isn't like her. And the effect she's had on events outside her own personal interests has been too great to shrug off. It includes creating a body out of nothing."

"A body?" Niki said. "You mean —she killed Jonas? But we all saw him electrocuted while we were a long way away from the generators—"

"You're close, Niki, I think she *created* Jonas—or the belt did."

Chapelin said: "Maybe you'd better go to bed, Hal."

"Maybe. First, you can explain to me why we haven't a single record in this camp which mentions 'old Jonas' *before* the accident happened. Check me if you like. Odd, isn't it? The first time he's mentioned is when we buried him. And the Council ship had never heard of him. To top it off—there are only five acceleration hammocks in the stores. Where's Jonas's? Did he come here in a bucket?"

"We buried him in his hammock," Laura said in a small voice.

"Did we? We only had five hammocks to begin with, the QM record shows it. It also shows rations for only five. With one less person, we should be accumulating an overstock of food, but we aren't, though we're eating exactly the same menus we've always eaten."

"Suppose it's so," Mike Cohen said. "Suppose there never was any such person as Jonas—it's a fantastic assumption, but your evidence seems to prove it—what's the point of such a deception?"

"That," Hal said, "is what I mean to find out. I also want to find out why I got about a century's worth of advanced ultronic math shoved into my cranium tonight, all at once, just at the moment when I would have blown us to kingdom come without it." He took the modulator out of his pocket. "This is the result. Knowing how *not* to blow us up fortunately includes knowing *how* to. Hand over that belt, Laura—or I'll disrupt it!"

Laura said, "I . . . I can't. You're right, Hal. I can't make everyone happy at once, so I have to admit it. But I can't give up the belt."

"Why not?" Hal demanded.

"Because . . . *I am* the belt!"

Chapelin gasped: "Laura, don't be insane."

"It was Laura that you buried. She was killed in the accident. As Mike says, there was never any such person as 'old Jonas.' I instilled his memory in your minds to account for the corpse, which was unrecognizable after . . . after what had happened to it."

The knife turned deeper in Hal's heart. Every curve, every coloring, every sound of the voice was Laura's—

Mike said softly: "We've done Frankenstein one better."

"I don't think so," Hal said steadily. "I think we've just re-enacted a limerick. Remember the one about the young lady from Niger? She smiled as she rode on the tiger—"

"They came back from the ride with the lady inside," Mike whispered, "And the smile on the face of the tiger."

"Yes. I don't think this is one

of our belts. Ours weren't complex enough to pull off a stunt like this, no matter how they might have been deranged."

The girl looked steadily at Hal; it was quite impossible to imagine that she was changed. "Hal is right," she said. "When your belt burned out, there was an instantaneous ultronic stress, a condition we call inter-space. The mathematics are difficult, but I can teach them to you. The results, roughly, were to create an exchange in time; your belt was sent a hundred thousand years into this planet's past, and replaced by this belt—myself."

"The people here knew ultronics?" Chapelin asked.

"Very well. Their belts were at first much like yours—simple levitating devices. But as they learned more, they found that they could travel space without spaceships; new belts made a protecting envelop, manufactured food and air, disposed of waste. As the centuries went by, the belts came to be the universal tool; there was nothing they could not do; eventually they were endowed with some intelligence and with the ability to read minds—to meet their owners' needs, and even anticipate them."

"What," Hal said, "happened to the people?"

"We don't know," Laura's voice said. "They died. More and more of them ceased to have children, or to take any interest in anything. We relieved them of all their responsibilities, hoping to give them all the free time they needed for satisfying their desires—our whole aim was service. But a day came when the people had no desires. They died. The belts were self-sufficient; in my time they still operated the cities. Evidently they gave up so purposeless a task later on."

Chapelin covered his face with his hands. "Laura—" he said brokenly.

"I regret your loss," the familiar, lovely voice of Laura said. "I tried to protect you from it—to supply what you seemed to need. Perhaps it would be better if I took some other shape now, so as not to remind you—"

"Damn your cruel kindness," cried Hal. "No wonder they died."

"I am sorry. I can repay. I can give you all the mastery of ultronics, of other forces whose names you do not know. New belts can be built for Earth, and a new world begun."

"No," Hal said.

Niki and Chapelin stared at him. "Oh, come off it, Hal," Niki said. "Be reasonable. This means we can all go home, and get off this stinking planet."

"And think of the opportunity for knowledge," Chapelin said. "Niki's right; what's done can't be undone, no matter how it hurts. We've got the future to think of."

"That's what I'm thinking of," Hal said. "Chapelin, weren't you listening? Didn't you hear what

happened to this other race when the belts took over? Do you want to wish *that* on Earth?"

"It sounds rather comfortable to me," Niki said. "Maybe *they* hadn't any desires, but *I* do."

Mike Cohen said softly: "It's only a matter of time, Hal. If we send the belt back to where it came from—if it'll go—we've still got the beginnings of ultronics right here. Sooner or later our crude belts will evolve into things like this."

Laura's belt saw, then, what Hal was going to do. "Hal!" her voice cried. "Don't . . . it's death for all of you."

Chapelin flung himself forward, his hands clawed, his face wild with fear. Mike Cohen stuck out a foot and tripped him.

"O.K., Hal," he said, almost cheerfully. "You're right. It's for the best. Let 'er rip."

Hal turned the modulator on full. The whole ridge of stars went up in a blaze of light. At the last, Laura's golden voice wailed: "Hal, Hal, *forgive me*—"

After that, nothing.

2/21/2121

The Strytis blast was a tragedy: yet I could not tell Hal that I would survive it without making him more unhappy than he was. Now, I must go on to Earth, where I may do better. I have decided to pose as Hal; it seems fitting; he had his race in his heart, as do I. We have, after all, a long tradition of service.

THE END

IN TIMES TO COME

Among items to be found next issue is the An Lab, which got squeezed off the bottom of the page just below here, as did about half of "Times To Come." In addition to Part Two of "Players of Ā," there will be an unusually full contents page. Dr. Winter, who appears this time with an article on his specialty, appears next month with a story, "Expedition Mercy," wherein he considers some of the nasty little surprises an alien world can offer men. It's a form of menace quite possible to an alien world—and exceedingly difficult for an expedition to detect beforehand! Also, it's a new one—which is quite an accomplishment in modern scf.!

THE EDITOR.

BRASS TACKS

Williamson happily massacres heroes when the logic of the situation calls for it. Did you read "Darker Than You Think?" Here, the curative powers of the new grid demanded reconstruction—logical necessity!

Dear Sir:

I am unable to bring to the criticism of SF the degree of technical equipment that your most avid readers seem to have. The scientific "rightness" of the stories is very apt to mean nothing to me, and since I know that this factor is usually viewed with the utmost concern by the connoisseurs, I have not been willing to comment on each issue of ASF, although I have been reading it fairly regularly and with a great deal of pleasure and benefit.

But Jack Williamson's ". . . And Searching Mind" almost forces me to write. To my mind it stands untouchably far above any other story you have published in the past year. It is one of the small group of SF stories that raises basic problems with a view to clarifying them rather than as a come-on to the reader. It is one of the very, very few SF stories that pays attention to the orthodox desiderata of character development and plot structure. Its virtues in these respects are pointed up by comparison with "Children of The Lens," a story that my friends agree in raving over but which I found almost ridiculously loaded with action that was sheer garbage from the point of view of the story-structure. As a matter of fact, Smith's novel has nothing to recommend it *except* its loose, picaresque treatment. Williamson, on the other hand, is very careful to state the general concepts to be dealt with very early in the story; he then sticks to them exclusively, while his characters—all except Ruth—are all clearly necessi-

tated by the exigencies of the plot and all acquire so much fullness in the course of the story as to have a real claim to reality.

I particularly liked the masterful way in which the main characters are successively brought into conflict with themselves and with the robots, on higher and higher levels of significance, until finally all the issues are in play. At this point, I must confess, I parted company with Williamson. The ending seems to me false and downright silly: White and Claypool should have either established the correctness of their case in a grand triumph, or else—if Williamson wanted it that way—should have been killed. The saccharine reconciliation, after the tremendous strength of the conflict, is disappointing. Why can't heroes die in ASF?

Finally, in contrast to Smith, Williamson handles his words with thorough competence; if not even with distinction. The dialogue was quite convincing, and the descriptive sections, apt to be either sparse or riotously luxuriant in SF, are very finely done. I hope the story is brought out as a book, but—with a different ending!—Howard Kaninsky, 6116 University Avenue, Chicago, Illinois.

The Unknown *anthology is delayed—but will be out in September.*

Dear Mr. Campbell:

I note with interest several writers to Brass Tacks—May number—have damned "Children of the Lens" with faint praise. One correspondent—E. C. Marshall—called attention to the novel's "ridiculous characterization," a criticism with which I heartily agree.

Dr. Smith has never been able to draw a character more believable that Frank Merriwell or Nick Carter, a fact which nullifies the vast scope of his works. As far as I can recall, every serial I've ever read in SF has pictured personnel with much greater realism than Dr. Smith.

Which brings me to ". . . And Searching Mind" by Jack Williamson. The author has written a well-balanced novel around a theme which has grown in interest since the collapse of the classical physics of the nineteenth century—the human mind. I doff my hat to that master craftsman—Jack Williamson—and present to him my congratulations for such an interesting presentation of a rather difficult subject.

As a rule, I'm strictly unconcerned about SF art, but Alejandro's cover for the May issue is exceptionally good.

What's with *Unknown?*—Samuel Gordon, 4606—72d Avenue, Landover Hills, Maryland.

Hail The Hale!

Dear Mr. Campbell:

Possibly your readers might like a first-hand account of the dedica-

tion of the 200-inch Hale telescope even though you can't get it into print inside of the next four months. Here is the way it looked to me from a "behind-the-scenes" viewpoint.

I had been handed the job of writing up the dedication for the Astronomical Society of the Pacific, so that in addition to an invitation I also had a press card. The principal advantage of the press card was that it entitled the bearer to a free meal at the Observatory, while the other guests had to forage for themselves.

Mrs. Richardson and I arrived about 1:30 and headed immediately for the big dome. There was a considerable crowd there already which seemingly had arrived exclusively in shiny new Cadillacs—obviously they were not astronomers. We found the press had the basement to themselves directly below the main floor. There were sandwiches and coffee and folders containing mimeographed copies of the speeches together with some astronomical information.

After refreshments we went upstairs and joined the throng that nearly filled the area beneath the 200-inch. Celebrities were so thick that you couldn't keep from bumping into them every time you turned around. Famous scientists cluttered up the stairways and choked the aisles. In addition, there were others who might possibly have received a bid as patrons of science. I recognized Dr. E. T. Bell the mathematician at Cal.-Tech, better known to SF fans as John Taine. Also Dr. George Gamov whose popular books on theoretical physics —"One, Two, Three—Infinity" —are widely known. Charles Laughton, who has been playing in "Galileo" in New York, was present dressed in worn old clothes so that he looked more like an astronomer about to go to work than anyone present. And dozens of others.

I won't mention the speeches since they were widely quoted in the papers. I followed them on my mimeographed copies while they were talking. Just for fun I rated them on a scale of 1 to 10. Dr. Fosdick of the Rockefeller Institute came in an easy first on my score card, rating an 8 or good three points over his nearest competitor. Fortunately the speeches were limited to about ten minutes each so that this part of the ceremony lasted scarcely an hour.

As members of the press we were invited to stay that night and have a look through the Coude focus of the Hale telescope. (Notice how carefully I refrain from calling it a "giant eye."). Thus we were at a loose end for several hours till nightfall. About six o'clock we wandered into the room the press had taken over for themselves. Found some more sandwiches, doughnuts, and by prying around a little, discovered seven quarts of James E. Pepper whiskey cached in various places. At 6:10 p.m., two bottles were empty and a third was

being rapidly depleted. (I understand that by 9:30 all seven were empty). Readers may recall that Tycho Brahe about 1575 dedicated his observatory at Uraniborg with wine, but the 200-inch rated stronger potions.

About eight o'clock the instrument was turned on Saturn and we all lined up for a look. Some of the press evidently tried to take snapshots of Saturn by shooting through the eyepiece and setting off a flashbulb, a procedure doomed to failure and frowned upon by those in charge. I could not suppress a slight rise in blood pressure of probably 20mm or so as my turn approached, although I had a pretty fair idea of what I would see. As usual, the seeing was poor and the heat of the crowd earlier had spoiled the figure of the mirror, so that the image of Saturn appeared rather blurred. But the immense light-gathering power of the glass was easily evident—three of the satellites appearing about like third magnitude stars. We lingered until about ten o'clock, talking over the events of the day and friends we had seen.

Outside the sky was really dark and the stars correspondingly bright—much superior to the sky we get on Mount Wilson where the lights of Los Angeles are a real menace to astronomical photography. After a brief inspection of the 48-inch Schmidt telescope, a beautiful tele-

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scope that will rival the 200-inch when it is finally in operation, we started the long drive back to Pasadena.—Robert S. Richardson, Mount Wilson and Palomar Observatories, 813 Santa Barbara Street, Pasadena 4, California.

Biology, huh? Well, we've got endocrinology in this issue.

Dear Mr. Campbell:

Due to illness and midterms I failed in my duty to comment on the May and June Science Fiction on time and now due to finals I shall be a bit brief in this.

May Cover: It captures your eye and the longer you look the more you see.

". . . And Searching Mind"—compelling, fascinating, but what if an alien culture had those robots and decided to get man out of the way for the benefit of their prime directive . . .

TIE FOR SECOND PLACE:

"The Obsolete Weapon"—darn entertaining satire.

"The Rull"—well done problem story.

"The Mechanical Answer"—this MacDonald seems to be a potential topnotcher, or maybe he is already.

"The Strange Case of John Kingman"—well done old theme.

June Cover: Trying to catch some detective story readers huh? This cover too closely approached the commercial surrealism that Street and Smith's three detective books have used in the past year or so. I prefer Alejandro, Bonestell, and Rogers and Timmins on wash jobs on the inside.

"Dreadful Sanctuary"—the lead character is incredibly well handled—especially his thought processes that involve the world about him. The story itself is building up for something terrific; further it is a story that can be definitely read on two levels. The futuristic adventure level and the philosophical level. Or maybe I should make that a sociological level.

"That Only a Mother"—Judith Merril has evidently written a lot for women's magazines and Science Fiction's readers are supposed to be about twenty per cent women. (My wife found the story highly upsetting because IT COULD HAPPEN NOW). In any event this is about the finest short story I have ever seen and if I weren't such an idea hound I'd give it a resounding first place for the first half of the year. If I ask for more, do you suppose Judith Merril would send you some more? What Science Fiction needs is one—or maybe more—good yarns by a woman in each issue to give the magazine a better balance and a wider appeal.

"No Connection" tain't no fair writing animal yarns. I fall for them hook line and sinker every time and find myself unwilling to look for faults. Asimov probably didn't include many anyway.

"War of Intangibles" good stand-

ard Science Fiction but it didn't have any of the unique qualities that made each of the other stories stand out.

Oh yes, my rating for the artist:

May: Cartier, Rogers, Orban, Timmins;

June: Cartier, Alejandro, Timmins, Orban.

As usual the editorials and articles were interesting though in the article I would like more biology which seems nonexistent in that department.—Rosco E. Wright, Rt. 2 Box 264, Springfield, Oregon.

---

1. We do have stories of favorable mutations! How about "Slan", for instance.

2. We did warn the Oak Ridge boys! Reread "Solution Unsatisfactory."

Dear Sir:

My wife has been a science-fiction fan ever since she started reading Jules Verne as a child. She is now forty years old. Her favorite in ASF of recent years is the Baldy series and William Tenn's short about the Make-A-Man set.

"That Only a Mother" gave her nervous indigestion and nightmares for a week afterwards.

For the love of Pete, can't we have a favorable mutation occasionally? Even in nature they do occur. I must admit that sometimes I long for the good old days when we read s-f for fun, instead of as a grim warning that all hell has been let loose. Why didn't you warn those Oak Ridge boys before they went ahead and did it and turned it loose to the innocent military men?

For the Analytical Lab:

1. "That Only a Mother," of course. It is, as a friend of mine said about "The Yellow Wallpaper" twenty-odd years ago, almost *too* good.

2. "Dreadful Sanctuary." It starts off good, anyway. Let us hope it won't get lost in a maze of double-talk and spin-it-out like some of the other serials. Or maybe I'm too lowbrow to follow them intelligently.

3. "No Connection."

4. "War of Intangibles."

We were much disappointed in ". . . And Searching Mind" as we thought "With Folded Hands . . ." was exceptionally fine. I think the sequel robs the first story of all its force.

For May, 1948:

1. "The Mechanical Answer."

2. "The Rull," or "The Strange Case of John Kingman." I can't decide.

4. "The Obsolete Weapon."

5. ". . . And Searching Mind," which I must put last after reading the end of it.

April's #1 story is "The House Dutiful," according to my wife. It gave me the creeps, but still I agree it is the best. It is the most original of the stories. That fellow Tenn is really good. 2. "New Wings." The other three tie for last place.

In March I liked "Film of Death" best.

The February stories were all good.

We have small boys who go bang-bang with toy weapons. No amount of double-talk or spaceship scene makes a good story out of that sort of thing. The chief trouble with Jules Verne is that his characters are all puppets; the chief glory of H. G. Wells is that his people are so much alive and three-dimensional—or four if you prefer! —Oliver M. Brown, San Francisco, California.

"S. S. Pineapple"—I guess it fits at that. But we've got to use something to make pages even, and lead type has no elasticity at all.

Dear Mr. Campbell:

There's only one applicable descriptive term for your July cover, and if it's a bad pun that's tough. But "heavenly" is the only word for it. You can judge how much I think of it by the fact that I make it the excuse for my second letter to you in some thirteen or fourteen years of readership. Consistently, your covers are the best. They are the only ones on science-fiction publications which I am not ashamed to show the cashier in the drugstore. But Bonestell's spaceship tops 'em all, even my boy Timmins, whose adroit signatures endear his work to me.

While we're on art, let me comment briefly on the old illos you use as filler pix. I was overjoyed to see one of my old favorities, which I hold in my heart under the title, "S. S. Pineapple", appearing in conjunction with the last instalment of "Children of the Lens". If memory serves, the knobby spaceship originally appeared with the first Lensman story and was either "Directrix I" or an early mauler. The one which filled a half-page in July, I couldn't place so readily. Wasn't it from some long story about "Who will guard those selfsame guardians"? Or is it an interior view of the Directrix II or III? 'Tenny rate, I like 'em. They serve to remind me of your excellent tales of the past.

Getting to July's stories. I rate "Police Operation" no. 1. Please feed Brother Piper some more Fort books. He apparently thrives on 'em. If the novelette hadn't been so good, first place would have gone to Installment Two of "Dreadful Sanctuary." This builds up nicely. Guess you'll have to tie the two shorts for third, but I thought both were excellent. Truly, an outstanding issue. I don't rate the articles, because I can't understand words of more than four syllables.

Since nobody else has brought out the point, I'd like to make the comment that Frank Arrowsmith's conduct in ". . . And Searching Mind" seemed highly illogical. Of course, the story had to be dragged out to its full length some way, but an explanation of the true status of the robots could have been given at any time with desired results.

Everybody seems to have their all time favorite stories, so let me nominate mine. It's "The World of Purple Light", by Van Lorne. Have you ever thought of publishing an annual with a brief novel, a couple of novelettes and about four or five good shorts? If you say a word about paper shortages, I'll break your arm!—Richard E. Conrad, 801-A Grand Central Avenue, Tampa, Florida.

When ten opens this fall, you'll hear from W2WHM, OM!

Dear Jawn:

Yes the April Astounding finally got here, although Mrs. H. wrote me that the March issue had become exhausted so that she could not send me that copy. And to be sure there are still a lot of the boys along the Tokyo road—some of us even beyond the end of that road. All you gotta do is go down to your favorite ham radio operator and sound off a good strong QX-QX-QX-QX . . . around five a.m. and keep howling for the far Pacific. You'll probably get a lot of boys along the Tokyo road—Johnson Island, Quajelein, Guam, Okinawa, Tokyo, Manila, China, and Seoul. We've got three ham stations here. Our own call is

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So the Finagling Finagle dares to prove him wrong—he does, does he. Well to start in you have the quib wrongly captioned. It should read "Finagle's Constant". One of the few constant variables.

The infinite series of one over the square of the successive integers from unity to infinity is a convergent series that has a relatively small finite sum. Any book on mathematical formulas or on series will give you the answer. I do not have my math library along with me on the road beyond Tokyo, so must pass up the answer. Suffice it to say that $y=k$ so that the y comes out in front of the integral sign leaving us to integrate.

$e^x dx$ between 0 and ∞ where $\int_0^\infty e^x dx$ becomes e^x-1 and the complete integral merely becomes ∞ multiplied by a finite constant, hence infinity. Letting x equal anything we want, we arrive at the fact that the complete solution of the constant k is infinity. True it might be anyone of many infinities—but then that proves the point that the Finagler's constant should be one of the few constant variables. Hence the supposition is that Finagle did his Finagling in the wrong way and that all the rest of his conclusions are entrapped in his wrong finagling.

Here Lies one Aching Back
In the far, far Pacific

On the mainland of Asia, its very self.—Hugo E. Hanser, The Bizenya Hotel, Seoul, Korea.

Don Berry was lucky—he wasn't home when the river moved in —and out!

Everyone knows of the disastrous flooding of Vanport City in which thousands of people lost all of their belongings.

Among the victims of the Vanport Flood was Don Berry, 17, youngest member of the Portland Science-Fantasy Society. Though he and his family fortunately escaped with their lives, they lost virtually all their possessions including Berry's extensive collection of science fiction magazines and books.

As fandom's own contribution to flood relief, the Portland Science-Fantasy Society is taking donations of magazines and books to replace Don Berry's lost collection.

If you want to help, send any duplicates or other science-fiction magazines and books you are willing to part with Don Berry, c/o PSFS, 3435 NE 38th Ave., Portland 13, Ore.—Donald B. Day, Pres., Portland Science-Fantasy Society.

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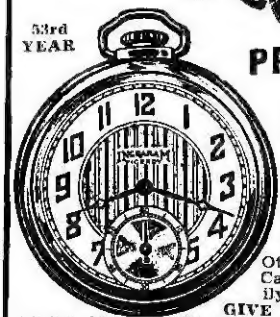

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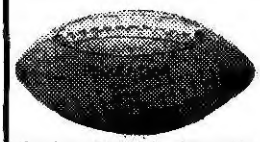

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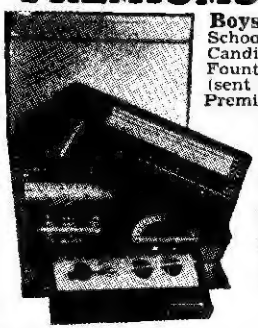

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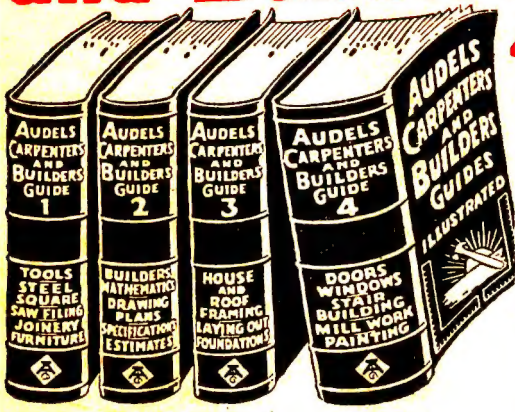
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